THE PETROLEUM Engineer

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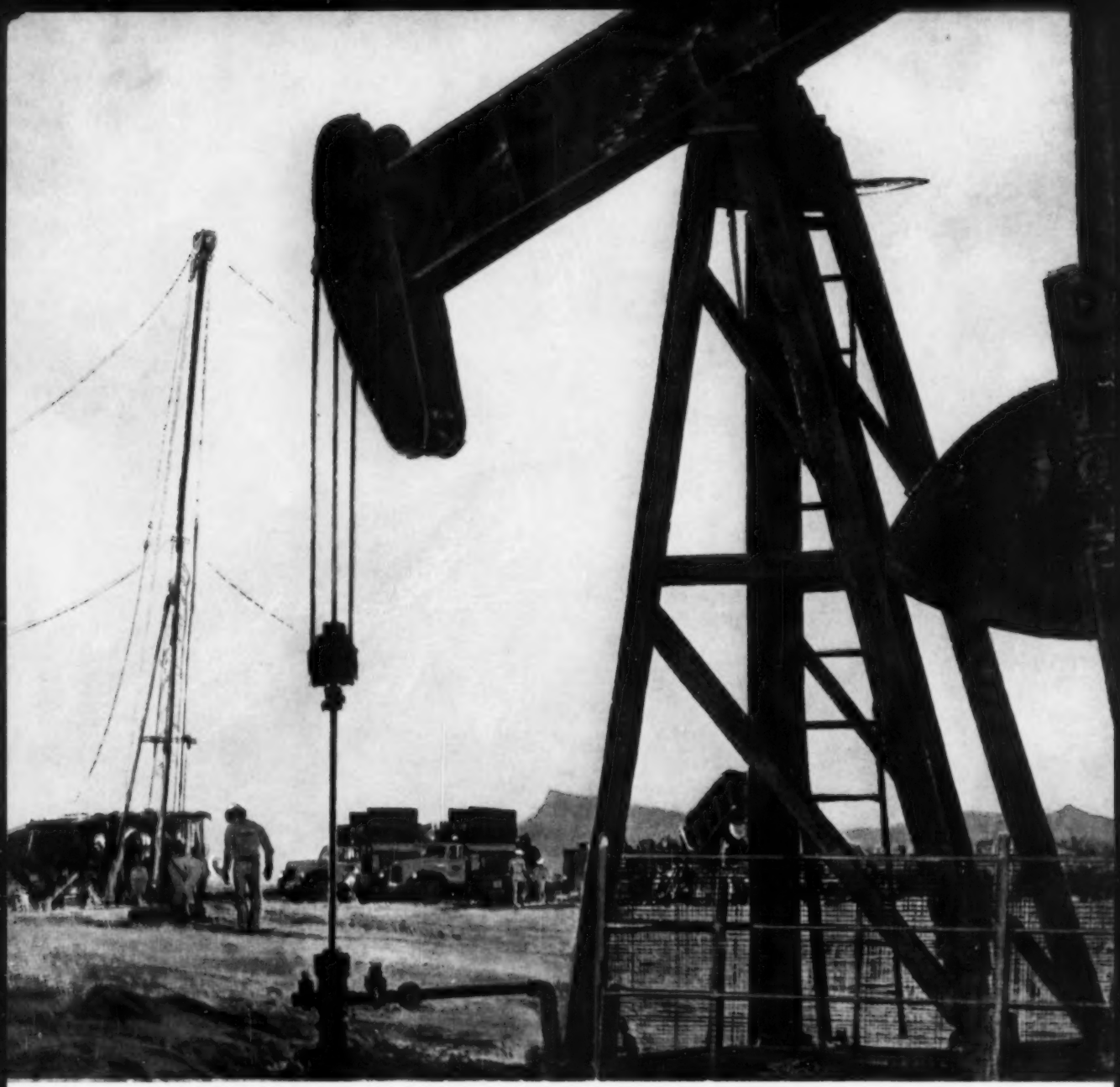
JULY 15, 1960

WORLD WIDE GUIDE

INTERNATIONAL ENGINEERING • OPERATING MONTHLY

NEW EQUIPMENT



SECONDARY RECOVERY-- EVEN MORE PROMISING WITH DOWELL'S NEW IDEAS!

Many of the tools, techniques and products recently developed by Dowell for improving well stimulation treatments are being used effectively in *secondary recovery* operations. For example, *Rockshock** — a new service using implosion capsules to lower injection pressures; *Abrasijet** — a service used to clean the formation face and condition the zone for better fluid acceptance; *Ezeflo** — a low-pour-point surfactant used to lower water injection pressure; *Slick Water* — a friction-reducing agent used to cut pumping pressures by more than half during stimulation treatments; and a special agent used to remove calcium sulfate and other scale deposits from formations and down-hole equipment. These are only a few of Dowell's new services and products — more new ideas are on the way. If you're involved in secondary recovery work, it will pay you to *dial Dowell*. Dowell, Tulsa 1, Oklahoma.

*DOWELL TRADEMARK

Services for the oil industry

DOWELL

DIVISION OF THE DOW CHEMICAL COMPANY

You Gotta' Have Tools

It took lots of vision, back-breaking work and plenty of guts by many men to develop our vital petroleum industry after Drake made his historic discovery at Titusville. Names like John D. Rockefeller, Sr., the Pews of Philadelphia and the lovable Michael Late Benedum ring loud and clear over the years.

Just as these...and thousands of oil men like them...have contributed so much, they had a partner who played a mighty important role in oil's dynamic growth.

I am referring to the service, supply and manufacturers of oil field and plant equipment...whose inventive genius and willingness to accept a challenge have provided the necessary tools and equipment to perform this building feat.

We've come a long way from the early tong and hammer days...the simple pot still. Growing pains were soothed with better ways of doing even bigger and bigger jobs. Needs for more powerful rigs to drill deeper and deeper wells, stronger equipment to handle higher pressures; bigger and longer pipelines to move greater volumes; larger and more complicated process plants to make a wider variety of products...have been met by those who have furnished the tools to build.

In a sense, this issue is a tribute to those who provide the tools...also men of vision, courage and a willingness to back their ideas with money and sweat. While the wildcatter was risking his capital on a hole in the ground...a pipeline through virgin country...a new type of processing plant...the tool maker was taking a chance on new ideas for equipment to do a better job cheaper and more efficiently.

For the most part...the editorial columns that follow are devoted to new or improved equipment from the drawing boards of these progressive firms.

We are proud to present this material...designed to keep you better informed on the newest developments in your field. If any particular product, service or equipment strikes your interest...we're happy to have served our purpose, and hope you'll take advantage of the business reply cards in this issue to obtain additional information.

The companies whose products are featured in this World-Wide New Equipment Guide have spent millions of dollars in research, development and production to bring you better tools for a bigger and better building job ahead.

Joe B. Hooks

Publisher

THE PETROLEUM
Engineer
DRILLING AND PRODUCING

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RHIA [RANK HAS ITS ADVANTAGES]

For decades, oil and gas men have turned to the Republic for the many varied and special bank services they require. Republic knows you must have accurate fact and figure data, prompt decisions on financing, and frequently, bank counselling with your lawyer on regulations and tax matters.

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CAPITAL AND SURPLUS $102,000,000 — LARGEST IN THE SOUTH

Course of oil

The giving monument

WHAT HAVE YOU GIVEN to your industry this year? You think that's a nonplusing question? You're doing your job, of course, or you probably wouldn't be there. You're giving your time and effort to doing it well and efficiently. What's this about giving to the industry?

First, let's look at it from the other direction —what does the industry give you? It gives you a salary — better than average — and — benefits — probably the highest in the country. It offers you interest and excitement even in a level economy. It provides association with intelligent fellow-workers and the satisfaction of running the most important energy industry in the world — an energy that devours heart-breaking labor and gives us a chance to live an abundant life.

Have you ever thought about why the petroleum industry can give you all these valuable benefits? It isn't because there's oil and gas in the earth. They were there thousands of years before you appeared. It's because of the people who gave something to create an industry. They didn't leave it as they found it. They left a heritage of fresh ideas, new techniques, short cuts, plans, capital, revolutionary machinery and equipment.

Our industry is a monument to givers.

Occasionally, in plodding times, it stands like that — a monument — a coral island waiting for living creatures to build on it.

But you don't want to work for a monument that your predecessors have built and this issue is proof that you don't. Thank God we have a lot of givers! At this time we've explored only equipment and machinery but it's an evolutionary crop of tools to handle more efficiently every phase of finding and using petroleum.

We hear so much about how much capital and how much drilling and refining capacity and pipelines we will need to supply the demands of the future. More than anything we need contributors to better and more efficient management and operations. Luke said, "Give and it shall be given unto you." The Bible is eminently practical and this fits an industry as well as an individual.

Do you remember the late Vice President Barkley's story of the politician who reminded a constituent of all the things he had done for him in the past, before asking for his vote? The citizen replied, "But what have you done for me lately?"

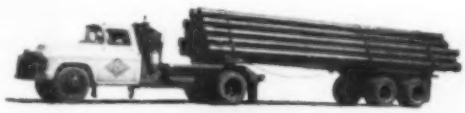
So we get back to that question. Please answer it truly — managers, researchers, engineers, contractors, operators everywhere — what have you given the petroleum industry this year?

Ernestine Adams

Congrats and $25 for this quip to J. P. DENNY, Phillips Petroleum Company, Box 1351, Odessa, Texas

Oil and gas men are quick to say that Lone Star products are "tough, top quality and delivered fast". Quick supply, and superior steel are among the reasons more and more have switched to Lone Star API casing, tubing and line pipe.

Exacting quality control combined with years-ahead manufacturing techniques today . . . are your guarantee of API standards in Lone Star pipe. And remember, delivery in the field is a matter of hours.



Neighbor, wherever you are, specify Lone Star and we both get a good deal.

Lone Star STEEL COMPANY

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There is a Woodward Hydraulic Governor for every internal combustion engine application. Our ninety years of experience in the governing field is available throughout the world. Write for complete information on all Woodward Hydraulic Governors.

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THE WORLD'S OLDEST AND LARGEST MANUFACTURER OF HYDRAULIC GOVERNORS EXCLUSIVELY

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Locked-liners are removed as a unit from the barrel jacket.

This one takes over where other pumps give up

The DI-HARD Subsurface Pump is "Oilwell's" answer to those really tough corrosion conditions you come up against in many areas.

DI-HARD resists extremely corrosive sour well fluids containing hydrogen sulphide. It also effectively resists medium carbon dioxide sweet corrosion.

The DI-HARD corrosion-resistant armor is uniformly hard throughout its thickness. There is no depth limitation beyond which wear rate accelerates.

Thanks to its low friction coefficient, barrels and plungers can be used together without fear of galling. And, when a close plunger fit is required in a hot well, the DI-HARD barrel and plunger will expand at the same rate, thus preventing seizing.

DI-HARD's locked-liner construction and unit honing assure perfect alignment of barrel. Sectional construction with "O"-Rings enables DI-HARD plungers to withstand high pressures.

Complete DI-HARD service, including money-saving exchange arrangements, is available from strategically located "Oilwell" or Neilsen Pump Shops.

USS, "Oilwell" and DI-HARD are registered trademarks

USS Oil Well Supply Division of United States Steel

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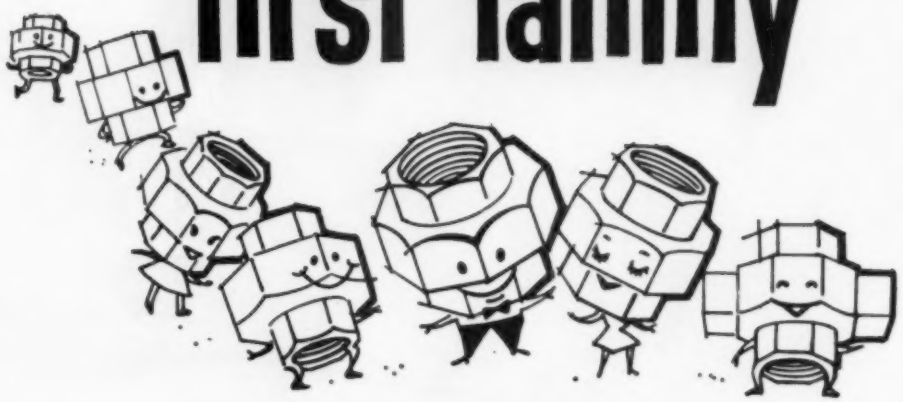
Meet America's "first" family



HOT FORGED STEEL UNIONS, VALVES & FITTINGS

No matter what the job or requirement . . . look to the Clayton Mark family of Unions, Valves and Fittings. With an "ancestry" that includes the *first* steel union in the industry, this illustrious family has many other accomplishments that command your attention. They were *first* to furnish the truly universal "Petro" Forged Steel Union to meet increasing pressure and temperature demands . . . *first* to introduce the fast-acting "Handlebar" type . . . *first* with Forged Stainless Steel Unions and *first* to produce a hardness differential in the seat to prevent galling. When you stock these members of the Clayton Mark family, you are assured of greater flexibility, less inventory and top performance.

Specify the brand that has been the "yardstick" of engineering acceptance since 1888 . . . CLAYTON MARK

Available in 50 States and throughout the world

CLAYTON MARK

AND COMPANY

1908 DEMPSTER STREET • EVANSTON, ILLINOIS • U.S.A.

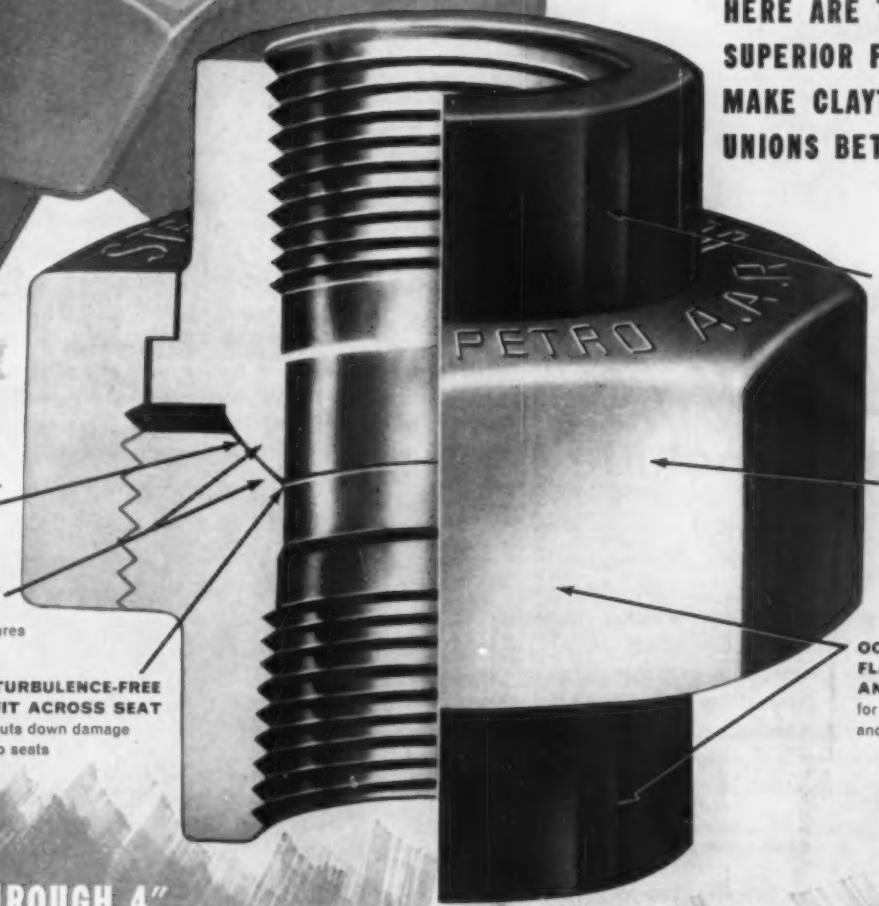
PUMPS · WATER WELL SUPPLIES · CONDUIT · UNIONS · TUBING

CLAYTON MARK FORGED CARBON STEEL UNIONS

★ Last Longer!
★ Work Better!
★ Cost Less!

RESIST WRENCH ABUSE!
Clayton Mark forged steel unions withstand excessive wrench abuse and repeated making and breaking long after other unions . . . forged or cast . . . have been discarded. They work better because they are hot forged and have superior features. So, they cost less . . . as much as five times less . . . than other brands.

HERE ARE THE SUPERIOR FEATURES THAT MAKE CLAYTON MARK UNIONS BETTER!



HOT-FORGED INDUCTION HEATED
parts are stronger, have uniformly fine grain structure

CADMIUM-PLATED NUT
for rust-proofing permanent lubrication

OCTAGON WRENCH FLATS ON NUT AND ENDS
for surer grip in making and breaking

45° CONE-TO-BALL SEAT
easy to make up tight

HARDNESS DIFFERENTIAL BETWEEN SEATS
prevents galling, assures repeated make-up

TURBULENCE-FREE FIT ACROSS SEAT
cuts down damage to seats

SIZES 1/8" THROUGH 4"

2000#, 3000#, 4000# and 6000# N.S.C.W.P.

Also STAINLESS, ORIFICE, HANDLEBAR and INSULATED UNIONS

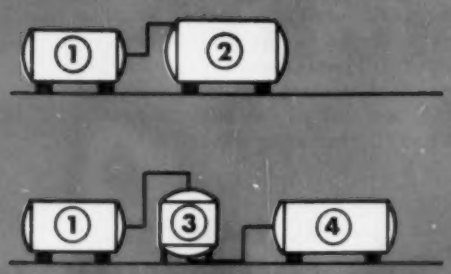
Does Your

Waterflood or Disposal

Problem Require...

A

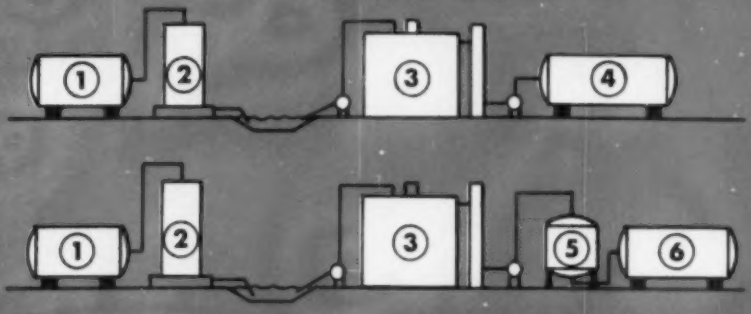
CLOSED SYSTEM



1. Oil Skimmers
2. Filta-Wash
3. Filters
4. Backwash Tanks

OR AN

OPEN SYSTEM?



1. Oil Skimmers
2. Aerators
3. Raw Water Treating Tanks
4. Filta-Wash
5. Filters
6. Backwash Tanks

BS&B AQUA-Kleener* Systems Include Both Types!

Your BS&B Representative can help you take the "guess-work" out of your waterflood or disposal problem. Whether you need a simple *closed type* system which excludes air from the process, or a more elaborate *open type* system which uses air as a part of the treatment, he can recommend the correct system from BS&B's full line of AQUA-KLEENER water treating equipment to solve your problem most efficiently and economically.

For the best possible field care of either permeable plate or graded bed type filters, the BS&B PHANTO-MATIC* Filter Backwash Controller is available to operate on either a time-cycle or a preset filter bed differential pressure. A complete installation including the PHANTO-MATIC Filter Backwash Controller and pumps is offered as a skid-mounted unit, ready for installation in the flow line.

* AQUA-KLEENER and PHANTO-MATIC are trade names of Black, Sivalls & Bryson, Inc.

Talk Over Your Water Treating Problems With Your BS&B Man, Or Write To...

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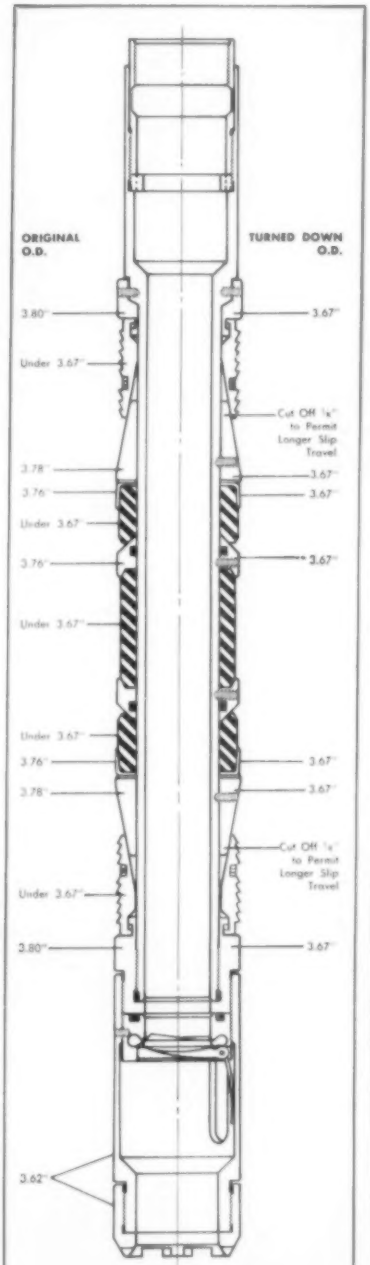
THE PETROLEUM Engineer

World-Wide Equipment Guide

OTIS PRODUCTION NEWS

Volume I, Number 3 **Otis Engineering Corporation • Dallas** *Production Equipment and Services*



TYPE WA OTIS PRODUCTION PACKER

Two Standard Model 4½" Otis Production Packers Turned Down To 3.67" O.D. And Set in 5" Drill Pipe

HOUMA, LA. – Otis packer specialists from the Belle Chasse and Houma divisions recently solved an extremely difficult well completion problem for one of the major producing companies in their area, by turning down and setting two of their standard model 4½-inch Type WA Production Packers between tool joints in stuck 5-inch drill pipe. The fact that these packers could be turned down from their normal 3.80-inches to 3.67-inches and set in 4.30-inch I.D. pipe, saved the operator a considerable amount of rig time in addition to the cost of having special packers designed and built.

Well conditions at the time the Otis specialists were called in were as follows: 12,500 feet of 5-inch, 19.50-pound drill pipe had become stuck in a salt water flow during final drilling operations and could not be freed. As a result, the pipe had been cemented in place at that depth and cut off at 2900 feet, then tied back to the surface with 7-inch, 29-pound casing. The only potential producing interval was located at 11,600 feet. Before attempting to bring in the well, the operator wanted to plug below, and set a packer above, the potential zone.

Probably the most serious problem facing the Otis specialists on this particular job was the fact that the operator wanted the packers set in the pipe between tool joints. This meant any packer run into the well would have to have an outside dimension of less than 3.75-inches to pass through the tool joints, yet have a sufficient range to set and hold in the 4.30-inch I.D. pipe. Although none of the standard production packers or bridge plugs available today are designed to cover this range, the Otis specialists felt confident their packer could be turned down and run. In the interest of time and cost, the operator agreed to try it.

After first running a 3.68-inch O.D. junk basket to 11,800 feet, the first Otis packer, equipped with an expendable sealing unit, was run in to 11,744 feet and set. In that this packer was to serve as the bridge plug, it was set 4 feet below a tool joint so that the cement to follow would straddle the joint and give a stronger plug. Running time was approximately 5½ hours, due to the viscosity and weight of the drilling mud. Once set, three dump bailer loads of cement were placed on top of the packer and allowed to set for 12 hours. At the end of that time, the plug was tested to 3500 p.s.i. Where fluid had been lost through the bit prior to plugging, there was no bleed down of pressure.

Next, the drill pipe was perforated and squeezed below and above the intended producing interval and the zone itself perforated. With these operations completed, another turned-down Type WA Packer was run and set between tool joints at 11,570-feet. A successful test to 1500 p.s.i. convinced the operator the packer would hold and swabbing operations to bring in the well were begun.

The help given this operator by his local Otis packer and completion specialists is typical of the service available from all Otis field personnel. Their knowledge of production problems and of the application, installation, and capacity of their equipment permits them to make sound, on-the-spot recommendations. The next time you find it necessary to consult with someone regarding packers or well completion techniques, call the Otis office nearest you or write Otis, Department 3-P, Box 35206, Dallas 35, Texas. You'll find experienced Otis well completion specialists ready to help you – anxious to serve you. © *1960 O. E. C.*

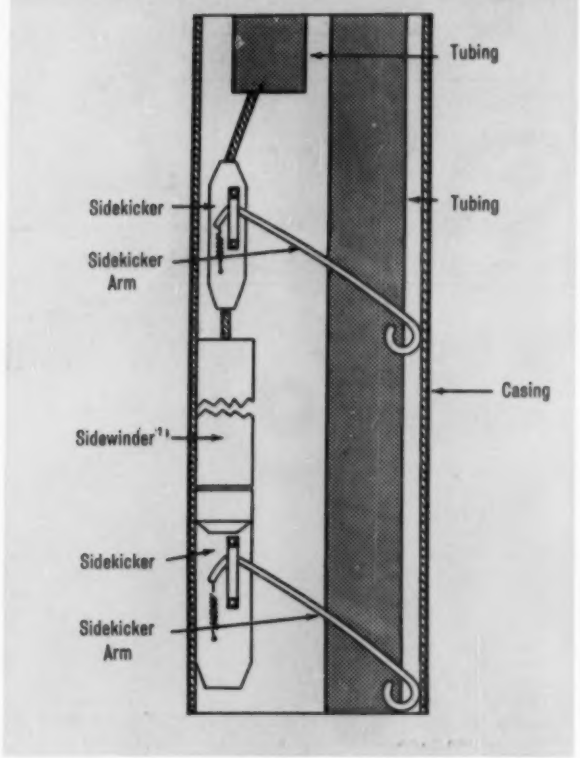
OTIS

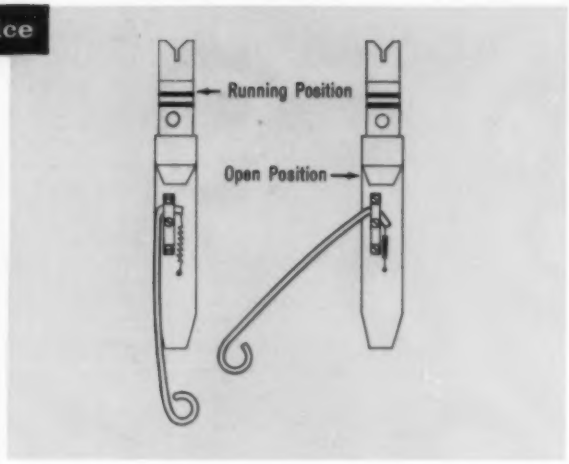
Engineering OTIS Corporation

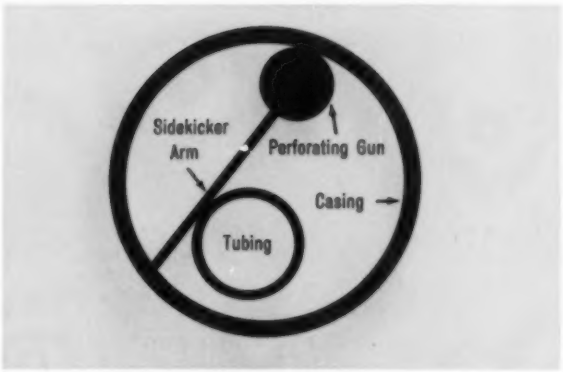
General Offices:

6612 Denton Drive • Dallas, Texas

Revolutionary New Completion Service







Sidekicker Solves Dual PWC* Problems

*** Permanent Well Completions**

Welex engineers have answered the problem of perforating an upper zone with no risk to the adjacent tubing string in dual permanent well completions. The new development — another first by Welex — offers these advantages:

- Service can be performed through 2" tubing and standard seating nipples.
- The Sidekicker, a mechanical orienting decentralizer developed by Welex, forces the Sidewinder[1] perforating gun against the side of the casing, assuring maximum penetration.
- The Sidekicker positions jet gun so that the charges will fire outward through the casing — never in the direction of the adjacent tubing string.
- Sidewinder[1] retrievable carrier absorbs the shock of detonation, protecting adjacent tubing string from damage.
- Absolutely no debris is left in the hole. All debris is retained in the carrier and returned to the surface.

Welex, the company that originated jet perforating proudly adds this new service to the other "firsts" that it has introduced to the oil industry.

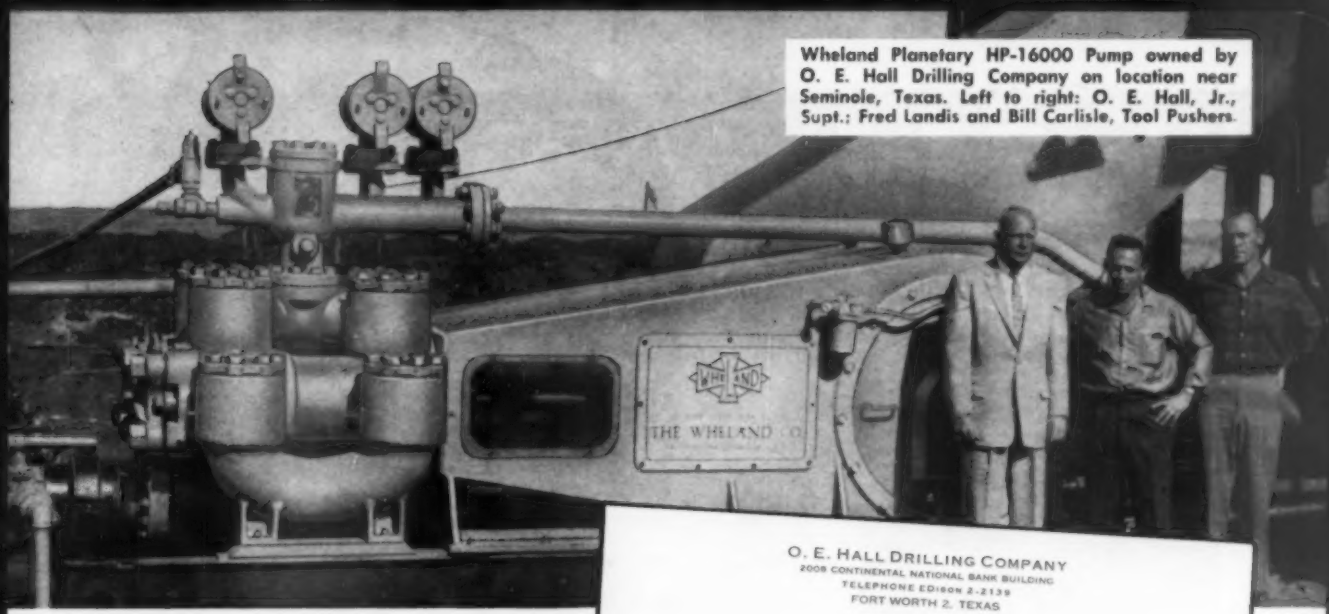
In Permanent Well Completions, as well as in other types of completions, Welex has a complete set of tools for every job. Next time and every time let Welex's completion services work for you.

WELEX, INC.

ORIGINATORS OF Welex JET PERFORATING

General Offices: 1400 East Berry, Fort Worth, Texas
In Canada: Welex of Canada, Ltd.

[1]*Trademark of Jet Research Center, Inc.*



Wheland Planetary HP-16000 Pump owned by O. E. Hall Drilling Company on location near Seminole, Texas. Left to right: O. E. Hall, Jr., Supt.; Fred Landis and Bill Carlisle, Tool Pushers.

"... the pump has improved our operation ... we will be happy to recommend it."

O. E. HALL, Jr.

WHELAND PLANETARY HP-16000 PUMP

Duplex Power Slush Pump

7 ¾" x 16", 600 HP at 65 RPM

O. E. HALL DRILLING COMPANY
2005 CONTINENTAL NATIONAL BANK BUILDING
TELEPHONE EDISON 2-2139
FORT WORTH 2, TEXAS

February 16, 1960

The Wheland Company
Signal Mountain Road
Chattanooga, Tennessee

Mr. Gordon L. Smith, Jr.
Manager Rotary Drilling Equipment Sales

Dear Mr. Smith:

We thought you would be interested to know how pleased we are with the performance of our Wheland Planetary HP-16000 Pump. It is the smoothest running pump we have seen. The big gear reduction makes possible such a small sheave and the pump pulls very easily. We are also impressed by the compactness of the gear cartridge and the smooth performance of the new circular crosshead. In the several wells we have drilled thus far the pump has improved our operation in terms of penetration rate and savings in bits. Also has exceeded our expectations.

All of these wells have been located in West Texas. We operate our rigs throughout the Permian Basin covering a depth range of 4,500 feet to 12,500 feet with modern equipment.

We want to commend The Wheland Company for stepping forward with this improved design in slush pumps, and we will be happy to recommend it.

Very truly yours,

O. E. HALL DRILLING COMPANY

O. E. Hall Jr.

O. E. Hall, Jr.
Midland, Texas

WHELAND

ROTARY DRILLING MACHINERY

THE WHELAND COMPANY

CHATTANOOGA, TENNESSEE, U.S.A.

DRAW WORKS • SLUSH PUMPS • ROTARIES
CROWN BLOCKS • TRAVELING BLOCKS • SWIVELS

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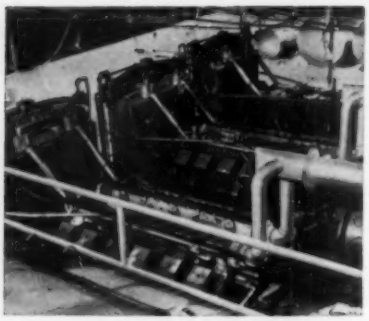
EXPORT DISTRIBUTORS: LUCEY EXPORT CORPORATION—233 Broadway, New York 7, New York—Broad Street House, London, E. C. 2, England.

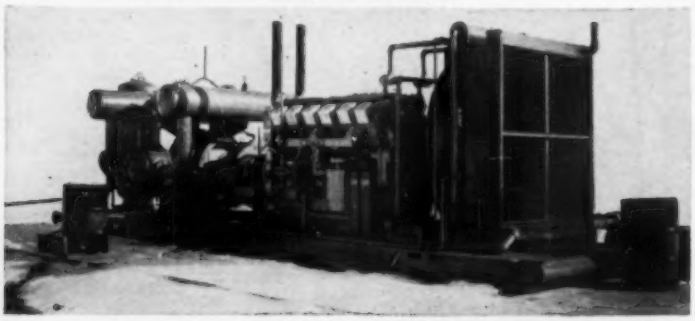
it's CLIMAX

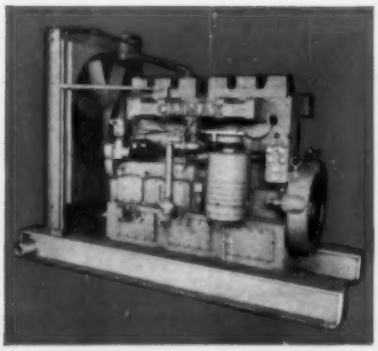
for DRILLING and PUMPING



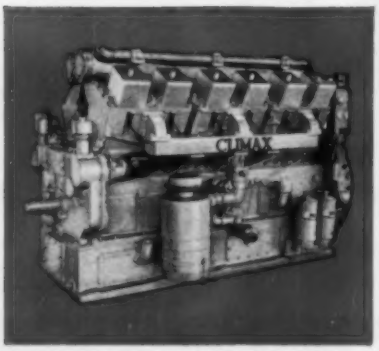
● Climax Engines have proven their reliability in hundreds of oil field installations. Single, well balanced design, rugged construction, and quality materials make them smooth running . . . for years!

for COMPRESSORS

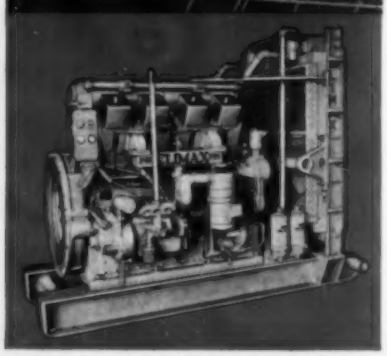




Model K-67—Max. hp 265 (Natural Gas)



Model V-125—Max. hp 605 (Natural Gas)

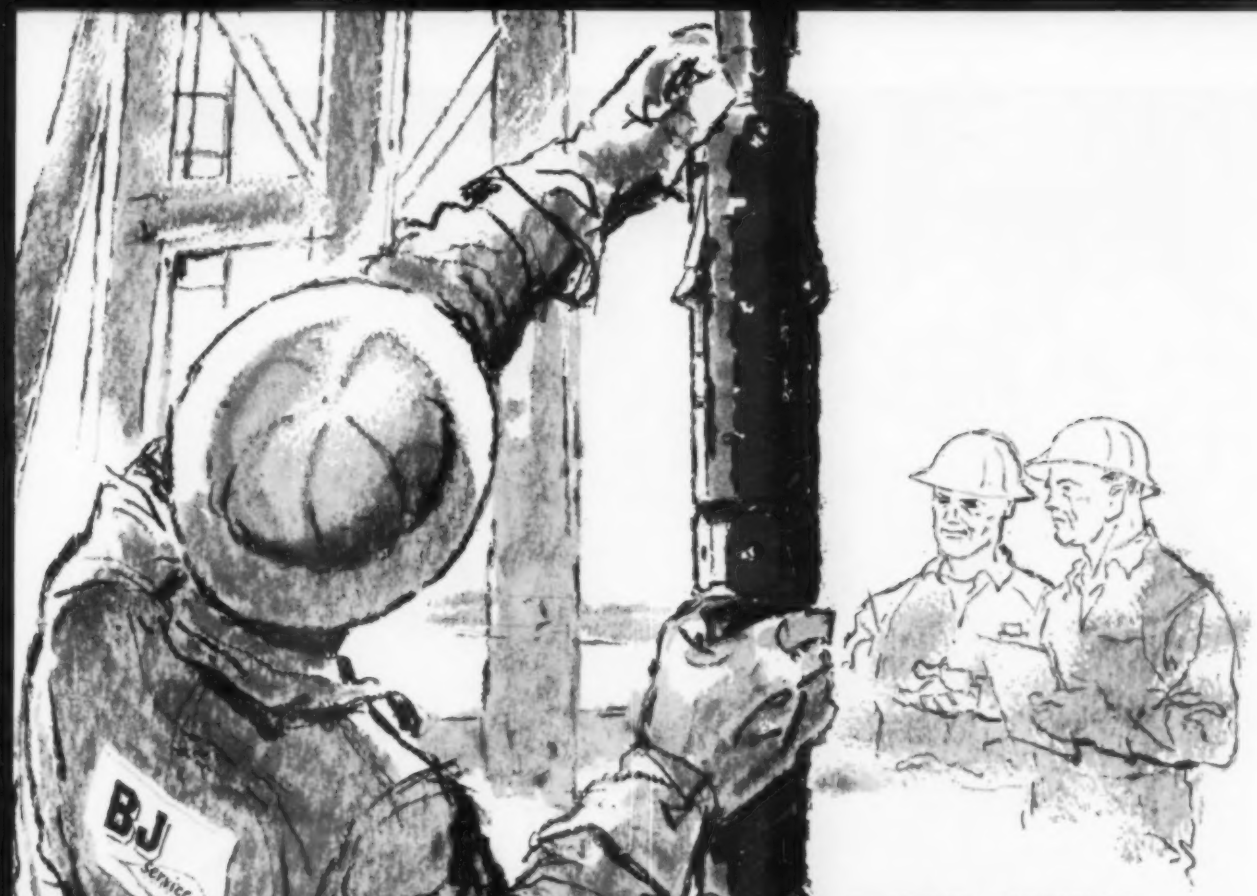


Model V-85—Max. hp 390 (Natural Gas)

CL-116

CONT. DUTY (NAT. GAS) →			DRILLING-PUMPING (80% RATINGS)						COMPRESSORS (65% RATINGS)				
Model	Bore & Stroke	Displ.	Peak Torque @ RPM	Brake hp at Speeds Indicated					Peak Torque @ RPM	Brake hp at Speeds Indicated			
				600	800	900	1000	1100		800	900	1000	1030
R-165	6⅛ x 7	1238	684 @ 750	81	105	117	127	135	557 @ 800	85	95	103	105
K-67	7 x 7	1616	955 @ 850	110	145	161	176	188	775 @ 800	118	131	143	146
K-75	7½ x 7	1855	1090 @ 800	126	166	185	204	218	885 @ 800	135	151	166	169
V-80	7 x 7	2155	1240 @ 850	140	188	210	230	246	1002 @ 800	153	171	187	190
V-85	7½ x 7	2474	1460 @ 800	164	223	246	266	284	1185 @ 800	181	200	216	221
V-122	7 x 7	3232	1920 @ 800	217	293	328	353	378	1562 @ 800	238	265	288	293
V-125	7½ x 7	3711	2240 @ 850	242	340	384	417	442	1820 @ 900	276	312	340	346

CLIMAX ENGINE MANUFACTURING CO. • DIVISION OF WAUKESHA MOTOR COMPANY
FACTORY—CLINTON, IOWA



TWO NEW MONEY SAVING TOOLS FROM BJ SERVICE!

Mechanical Collar Locator Accurately Positions Tubing in the Well

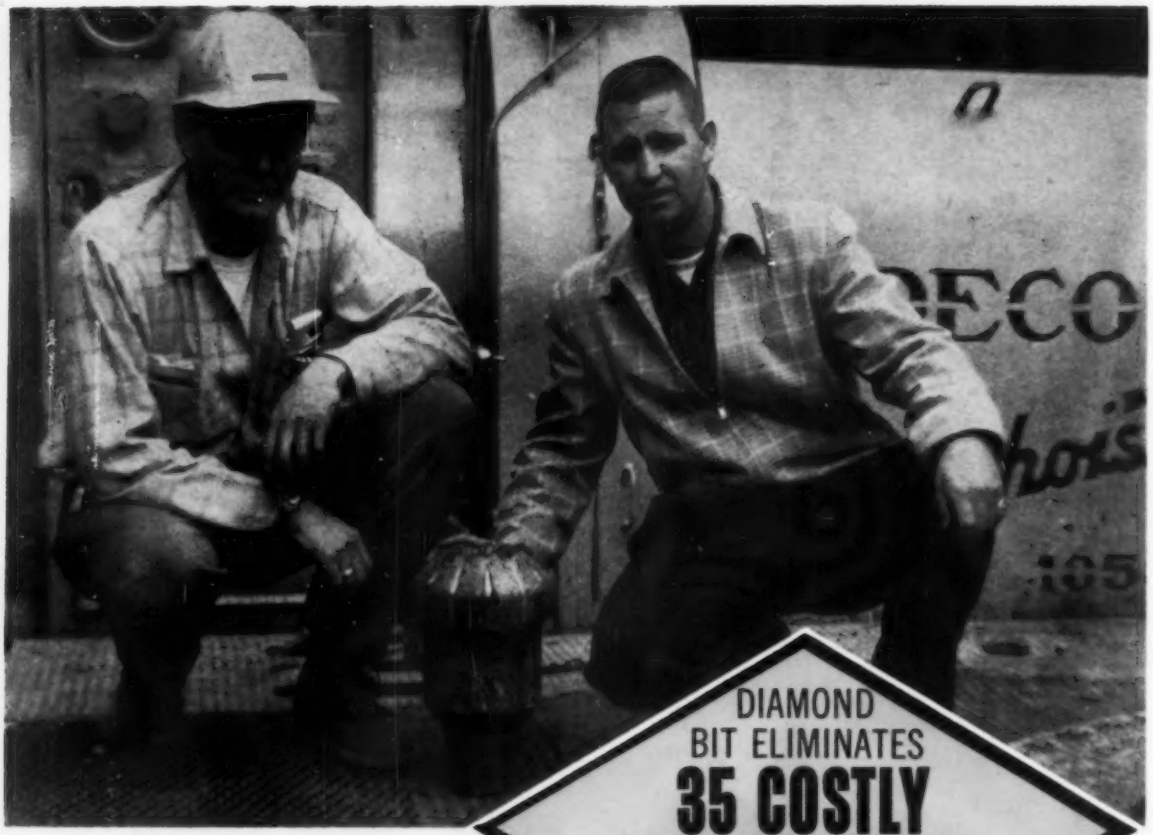
A natural companion to the Notch Jet Perforator, this rugged BJ Service tool locates the bottom of your tubing in any cased well. It allows you to run tubing at the normal speed—doesn't slow down your operation. It can locate any casing collar as many times as desired. In addition to working with the Notch Jet, the Mechanical Collar Locator gives accurate information for such critical operations as setting packers, testing and squeeze cementing.

Notch Jet Hydraulic Perforating Tool for Better Fracture Initiation

New development from BJ Service gives you the desirable wedge-shaped notch for single point entry fracturing. The Notch Jet is faster, more efficient and less expensive than wire line or mechanical cutting tools. A new development by BJ Service engineers, Notch Jet angles the sand-laden fluid to avoid splash-back—gives deeper, cleaner penetration!

BJ SERVICE, INC.

A BORG-WARNER SUBSIDIARY • LONG BEACH, CALIFORNIA • ARLINGTON, TEXAS



DIAMOND
BIT ELIMINATES
35 COSTLY ROUND TRIPS

Christensen Diamond Drilling Bit sets endurance record of 28 rotating days on bottom

The new record was set by a major oil company using an 8-11/32" Christensen diamond drilling bit in Natrona County, Wyoming. After 28 days rotating on bottom the bit was pulled at approximately 16,000 feet and found to be in fair condition. The operating company estimated that 35 round trips and 35 conventional bits would have been needed to drill the same intervals and that the diamond bit saved 18 days.

The bit operated under 10,000 to 16,000 pounds of weight at 53 to 57 R.P.M. The drill string consisted of 4-1/2" drill pipe, nine 7" collars with a set of jars. A second diamond bit had no trouble reaching bottom and ran for 16 rotating days, also surpassing the old 13 day record for the area.

For "Less Cost Per Foot" drilling, contact Christensen Diamond Products Company for information about its complete line of diamond bits and core barrels.

"Less cost per foot."

CHRISTENSEN DIAMOND PRODUCTS

MAIN OFFICE AND PLANT 1937 SOUTH 2nd WEST
P. O. BOX 387 SALT LAKE CITY, UTAH

NEW BAROID RHEOMETER TESTS FLOW PROPERTIES

The new BAROID RHEOMETER is a rotational viscometer to field-test the flow properties of drilling fluids. The BAROID RHEOMETER operates at two rotational shear rates. Readings are used to determine the *plastic viscosity* and *yield point* of drilling fluids.

USES NO ELECTRICAL POWER

The precision-built BAROID RHEOMETER operates by turning a small crank. This drives the rotor at a pre-selected constant speed of either 300 or 600 rpm. It can be operated at a higher speed to stir samples. Gel strengths can be determined with direct readings from a deflection scale. Write for complete information and price.

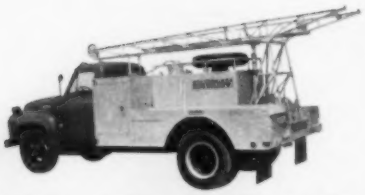
BAROID

BAROID DIVISION National Lead Company, P. O. Box 1675, Houston 1, Texas

Licensed by the courtesy of Socony Mobil Oil Co., Inc. under its Patent Number 2,703,006.

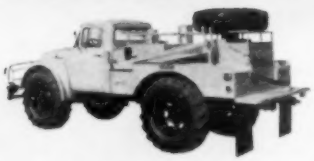
6005

GRIFFIN most complete line of geophysical equipment and supplies.



SHOOTING TRUCK AND HOLE LOADING MACHINE
Custom-built with 1200 lb. powder capacity. 650′ x 3/8″ wire line capacity, power driven drum for loading deep, tough holes.

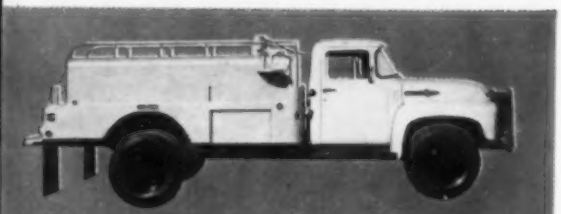
DOUBLE DRUM CABLE PICKUP TRUCK
Features 2 electrically powered drums, hydraulic brakes, custom-built frame with safety bar and boxes for multiple seises.



MARSH SHOOTING TRUCK
Large traction-type tires give excellent maneuverability in marsh or soft terrain operation. 300 gal. water capacity, 550 lbs. of powder.

COMBINATION WATER AND EXPLOSIVE TRUCK
1200-lb. powder cap. 500 gallon water cap. Powder, caps accessible from either truck side. Custom-built, all style choices for all types of equipment.

GRIFFIN SUPPLIES THE ENTIRE WORLD WITH CUSTOM-BUILT GEOPHYSICAL EQUIPMENT



1,000 GAL. RECTANGULAR TANK TRUCK
Available in all tank capacities. Custom-built for maximum carrying load.

SEIS CABLE LINE TRUCK
Custom-built to reeve cable through squirter from any direction into cable bin.

ROUND-BOTTOM, FLAT-TOP WATER TRUCK
1485 gal. capacity—this famous Griffin "STRIP-DOWN" model assures maximum load with minimum truck and tank weight.

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Seismic instrument body. Custom-built for all types of instruments and specifications. Aluminum, Stainless steel and Paint Grip materials. Standard or Air-Conditioned.

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RUN IN MULTIPLES

RUN UP PROFITS

Brown multiple-string elevators and slips let you run all tubing simultaneously when completing multi-zone wells. You can cut time and trouble — actually change your profit picture with this handy combination. Stingers can be securely locked in packers, all equipment can be made up and thoroughly checked before going in. No more fumbling in deviated holes, yet you can retrieve strings one-at-a-time, and replace them at will.

Next time you run parallel tubing, call Brown. Experienced service crewmen with all the equipment you need — including multiple Blowout Preventers are ready to help. Just phone our nearest representative for a smooth, safe, simplified completion.

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See our color movie covering the first five-string completion in its entirety — contact Brown Oil Tools, Inc. at any office.

DRISCOSE BRIEFS

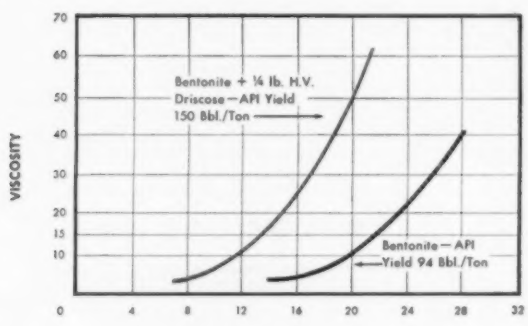
DRILLING DATA REPORT 60-3

High Viscosity DRISCOSE* Increases Bentonite Yields and Controls Viscosity Of Low Solids Muds

As drilling costs continue to rise, contractors and operators are looking for more and better ways to economize. For years our engineers have been showing them how low solids muds made with Driscose help keep drilling costs to a minimum. We're accustomed to getting good reports from all over the globe about the many money-saving benefits that Driscose makes possible—such as increased penetration rates, extended bit life, low water loss and many more. Just recently, though, we've heard a surprising number of comments about how well Driscose performs in souping up bentonite yields and controlling viscosity. These are old tricks for Driscose and are often taken for granted by mud engineers.

How Much Driscose to Control Viscosity?

Our High Viscosity Driscose, as the name implies, is highly effective as a viscosifier. The graph below shows a big increase in viscosity with only ¼ pound per barrel of High Viscosity Driscose. A ratio of one 50-pound sack of Driscose to 8 or 10 sacks of bentonite is a common cure for viscosity problems in the field. Naturally, the requirements of any given well must be considered, but, in general, a low solids mud system can be controlled with less than ½ pound per barrel of this 99+% pure product.



Effect of High Viscosity Driscose on viscosity and bentonite yield.

Bigger Bentonite Yields

Long before low solids muds became so popular, our medium grade Driscose had already proved itself as a fast, economical treatment to increase bentonite yields. Our High Viscosity Driscose is even more efficient. The chart shows the effect of less than ¼ pound per barrel of High Viscosity Driscose on the API yield—a 60% increase from 94 to 150 barrels yield per ton. Our research people have shown us that a ratio of one pound of High Viscosity Driscose to 1¾ pounds of bentonite will produce a mixture with an API yield of approximately 2200 barrels per ton.

Reduced Drilling Costs

Our field data proves that operators using low solids, high-viscosity Driscose muds can expect big savings in mud-up costs because the need for bentonite and other additives is so greatly reduced. But in addition to lower initial mud costs, the effects of controlled viscosity can and do produce sizable savings through faster penetration, longer bit life, fewer fishing jobs and reduced downtime. When you figure the cost of downtime from $30 to $300 and up, a little Driscose to control the mud system is an economical buy.

For more details on money-saving, low solids muds made with Driscose, see your nearest mud service dealer . . . or write us direct for technical literature.

*Driscose is a trademark for Sodium Carboxymethylcellulose

DRILLING SPECIALTIES COMPANY
Bartlesville, Oklahoma

SECONDARY RECOVERY OPERATORS GET IMPORTANT HELP WITH DOWELL SERVICES

Secondary recovery—water disposal—gas injection —pressure maintenance: day by day, these activities are becoming more important in profitable operations of producers everywhere.

Dowell has unexcelled experience in treating *both injection and producing* wells. A complete line of services and products is available from Dowell to help you realize more profits.

In Eastern Kansas, the cost of a Dowell fracturing program on a waterflood unit was less than three cents per barrel of oil recovered.

In Alberta, Canada, Dowell helped an operator convert six producing oil wells and gathering lines into an injection system for waterflood service. The work was done in a fraction of the time and at a fraction of the cost of conventional methods.

In South Louisiana, Dowell helped three operators increase the average gas injection rate on seven wells from 3.9 to 11.5 mmcfd with Dowell "tailored" acidizing.

In all areas, Abrasijet*—Dowell's abrasive jetting service, is being used to help operators increase either production or injectivity at low cost.

Whether you need Abrasijet, fracturing, acidizing or any one of a wide variety of chemical or mechanical treatments, *dial Dowell.* Dowell services and products are available from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina and Germany. Dowell, Tulsa 1, Oklahoma.

*DOWELL TRADEMARK

Services for the oil industry — DOWELL

DIVISION OF THE DOW CHEMICAL COMPANY

Making hole faster—Gardner-Denver's

2100 horsepower

One-piece construction

Air-actuated controls

Ample braking power

Eight hoisting speeds

Four rotary speeds—two reverse

Word is getting around that the smooth-running Gardner-Denver "2100" handles bigger loads at higher speeds . . . has the power and stamina of a giant. If your next well is a deep one—15,000′ on down—get the facts on the "2100". Call your Gardner-Denver oil field specialist.

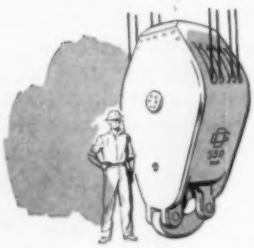
Here's what you get . . .

More Than 130,000-lb. single-line pull

One-piece construction—hoist and transmission contained on one frame and housing. By disconnecting only one chain, drawworks separates from compound . . . no internal air or oil lines are disturbed.

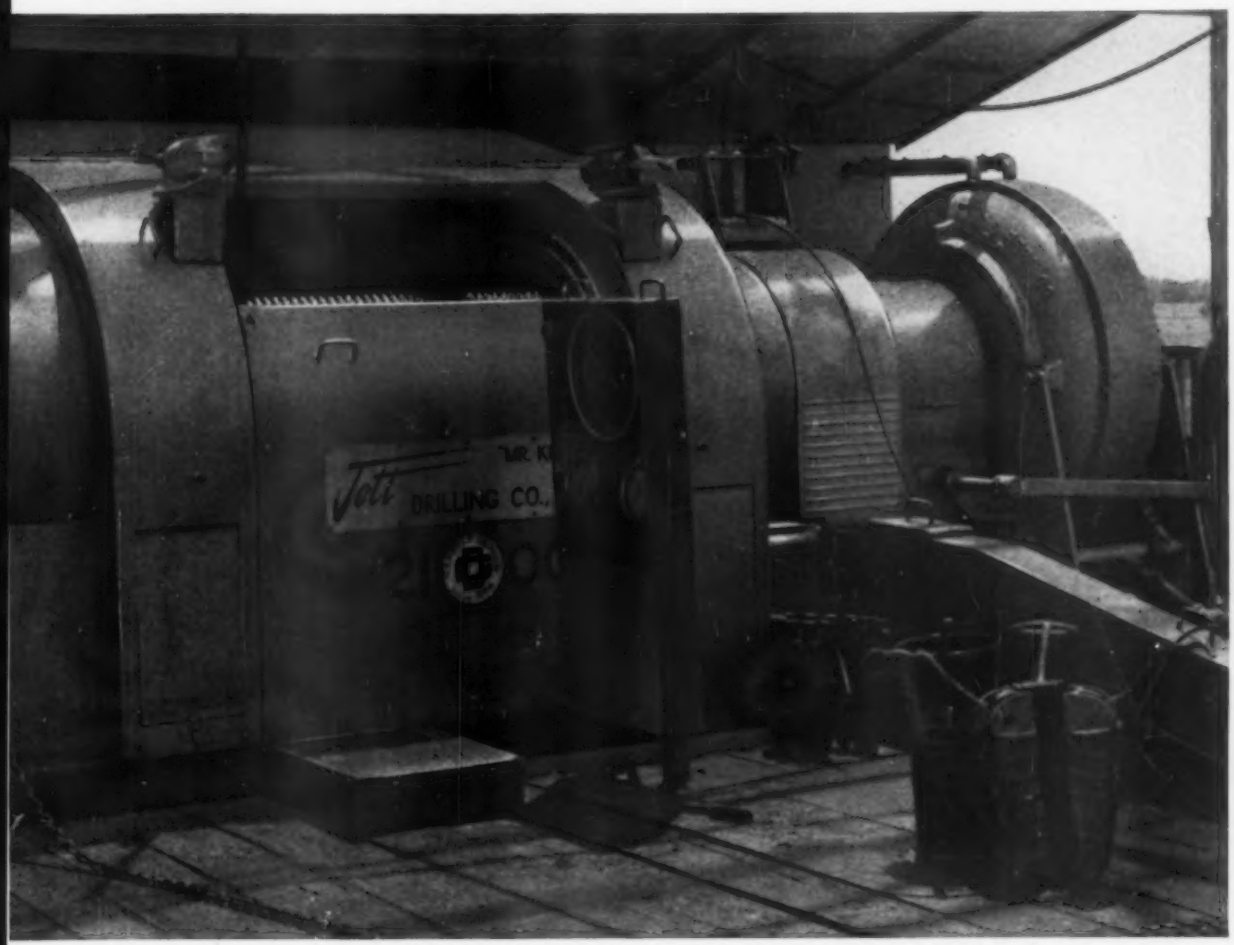
36″ x 60″ drum core—total capacity: 4100′ of 1½″ drilling line.

WHAT'S NEW AT GARDNER-DENVER?



Matched component equipment for the Gardner-Denver "2100" drawworks: crown block, traveling block, swivel, rotary table, compound. Also a new 1500 hp drawworks and matched component equipment.

new power-packed "2100" drawworks



Ample braking power—60" x 12" brake rims. Self-energizing, 330° wrap brake bands with tension-type equalizer. Water-jacketed, demountable brake rims.

Air-actuated clutches—high-capacity PO type Twin Disc triple-plate air clutches provide compact torque transmission . . . smooth power flow.

Easy-to-use controls—air-actuated control valves mounted on compact control panel in logical operating sequence. All are prominently marked for quick, easy accessibility.

Compact transmission—eight forward drum speeds, two reverse . . . four forward rotary speeds, two reverse. Specially designed interlocks prevent locking up in more than one forward speed or driving simultaneously in forward and reverse.

SPEED SPECIFICATIONS

SPEED	LINE SPEED	LINE PULL
1	422	131,500
2	585	94,750
3	820	67,600
4	1140	48,700
5	1530	35,500
6	2120	26,200
7	2940	18,850
8	4100	13,400

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FOR FURTHER INFORMATION ON ADVERTISED PRODUCTS, SEE READER SERVICE CARD

"This GUIBERSON DRILLABLE PACKER

runs, sets and drills faster than any other permanent packer"

HERE'S WHY!

Guiberson Type A Drillable Packer..

REDUCES PREMATURE SETTING Casing drag and junk impact are transmitted through the mandrel shoulder directly to tubing string.

REQUIRES ONLY ONE-HALF TUBING TRIP to set and place in production . . sets on wire line, too.

REQUIRES LESS SETTING FORCE Spring loaded lower slips are held drag-free from the casing until packer is set . . teeth remain sharp.

REQUIRES LESS DRILLING TO REMOVE Top slips are first part drilled. After drilling through them, packer can be fished out, or ½ to ⅔ of packer can be drilled and rest pushed to bottom of hole.

USES A SUPERIOR, OIL FIELD PROVED PACKING ELEMENT . . made in Guiberson plant.

FORMS A POSITIVE SEAL Unique internal mandrel shoulder expands packing element. All weight and high pressures are transmitted to packing element for a positive seal.

Compare Guiberson Drillable Packers for single or multiple-zone production . . acidizing . . pressuring operations . . water-flooding . . testing . . corrosion control . . many other completion jobs. Their speed and efficiency of setting and positive seal cut operating and replacement costs.

There's a Guiberson packer for every drillable packer application . . See your Guiberson man

TYPE A — With flapper valve and junk pusher

TYPE AN — No flapper valve.

TYPE AG — No flapper valve . . has guide body in place of junk pusher

TYPE AT — Has integral tail pipe connection . . no flapper valve

TYPE W — Small diameter . . wire line set only

TYPE AR — Small mandrel ID . . with flapper valve

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Sold by Oil Field Supply Stores Everywhere

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GUIBERSON

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ESTABLISHED 1919

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A complete, dependable line of primary cementing equipment available to you . . . "Through Your Supply Store".

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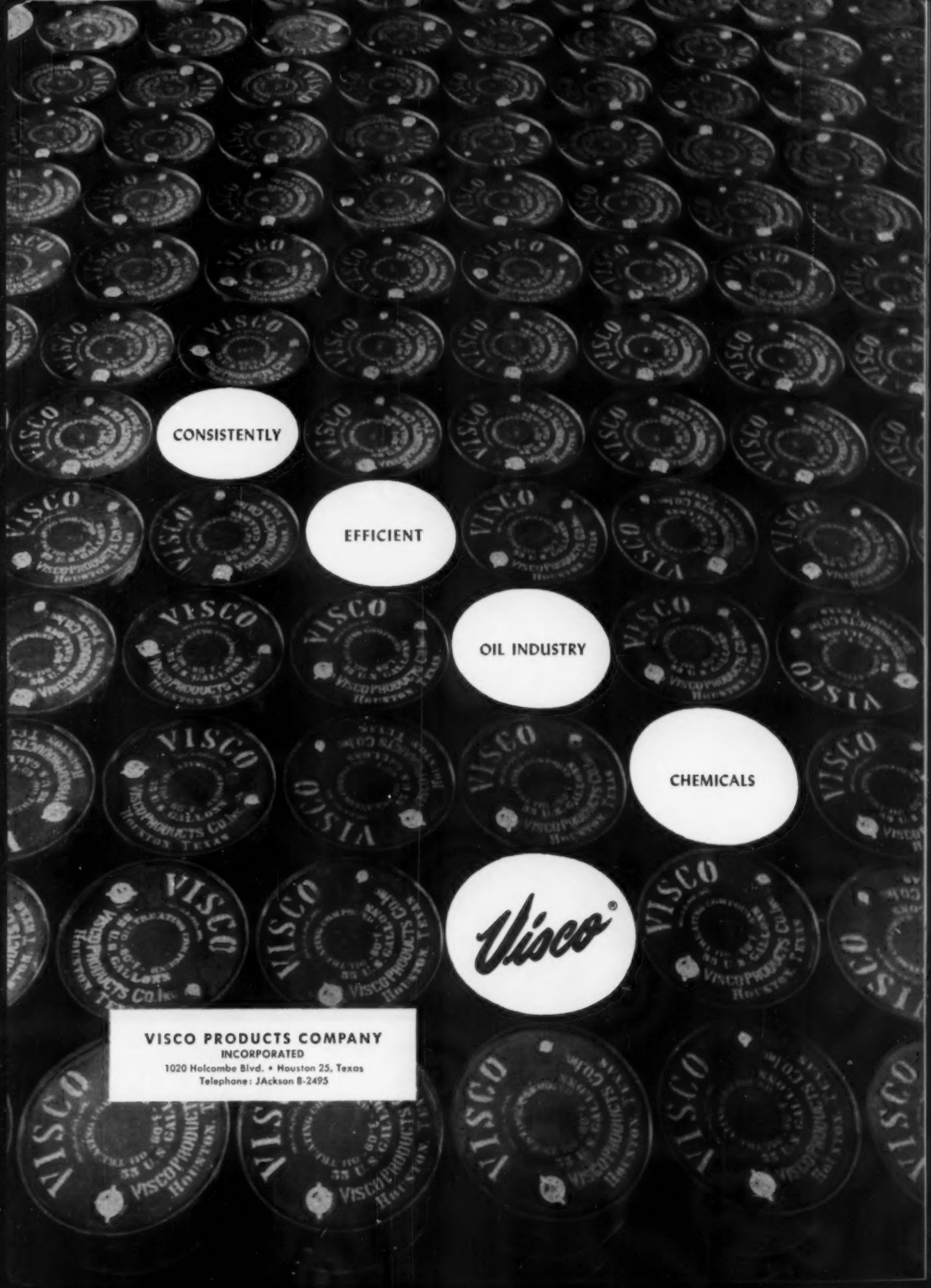
LARKIN LEADERSHIP HAS BEEN EARNED BY YEARS OF DEPENDABLE PERFORMANCE

LARKIN

...Through Your Supply Store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THE WORLD'S DEPTH RECORD for a successful fracturing operation was recently performed in Oklahoma using Halliburton's CHEMFRAC process . . . a method of injecting sand with a controlled emulsified acid solution. Deepest injection was at 15,758′ in the Bromide formation.

When you program your next fracturing job, design it around one of these *proven* Halliburton processes. Each process has been carefully developed for best performance in a given group of formation conditions. Together, they provide a multitude of solutions to fracturing problems the world over.

Take advantage of this complete fracturing line-up . . . plus the coordinated effort of your nearby Halliburton Fracturing Team. You'll see an unmatched combination of Halliburton men, materials and equipment working with a single aim . . . to help you get the *most* performance from your fracturing dollar. Call your local Halliburton Representative.

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FIRST...AND STILL FOREMOST...IN FORMATION FRACTURING

Visual and permanent records of your fracturing operation on-the-spot . . . the HALLIBURTON FRACOMETER! Ask about it.

MOST RESPECTED PACKER

It's known the world over for sheer downright dependability

BAKER RETAINER
PRODUCTION PACKER
PRODUCT 415-D

THE DOUBTS that harass well operators got a real body blow when the now-celebrated Baker Retainer Production Packer was developed some years ago.

This is probably the most predictable (and certainly the most respected) packer ever to go into an oil well. It commands the respect and confidence of operators the world over.

WHAT'S THE SECRET of building a packer so tough and reliable you know it will keep you honest when you recommend it?

For one thing, it takes time—years of performance studies. We've sweated out failures and assessed our successes—sifted out weak points and strengthened the strong points.

This great packer is at work right now in tens of thousands of wells—the average wells, the corrosive wells, the deep, hot, high pressure wells.

THAT'S A TOUGH proving ground—one that has helped us soak up a vast knowledge of what happens to slips, packing elements, and the like, when a packer is downhole. We've got the facts.

Baker made the first retainer packer—for many years the *only* retainer-type packer. The result is a wealth of packer experience that's hard to equal.

This remarkable packer shows it. Over the years we've refined it into a tool that has unyielding stamina. That's why we can call it the most predictable packer of them all.

This great packer has many applications—it's as versatile as it is dependable. It's a single-string production packer that comes in many sizes and bores. Moreover, it is surrounded by a family of accessories that transform it into a dual or triple packer—or into a temporary or permanent bridge plug or squeeze tool. Its formidable pressure-holding capacity makes it in many ways one of the finest of all squeeze packers.

It is set on a wire line—or on tubing or drill pipe. Baker's fast new milling tool mills one out in two to four hours—a fourth the time it once took.

For the latest practical knowledge of how to use Baker Retainer Production Packers, call your Baker Representative.

BAKER

RETAINER PRODUCTION PACKER

BAKER OIL TOOLS, INC. HOUSTON / LOS ANGELES / NEW YORK

Meeting critical conditions . . .

OIL FIELD SUPPLIERS STREAMLINE OPERATIONS

Faced with a buyer's market, suppliers retrench by centralizing warehousing, tightening credit extensions, automating procedures, emphasizing training of personnel. Low profit margin of suppliers may force attrition of some companies unless conditions improve

WALTER A. HOGAN
Field Editor

THE OIL FIELD SUPPLY industry, which has played a major role in the development of the petroleum industry, faces drastic retrenchment in the next few years to compete in a shrinking market.

Inventories stand at a high level, with tubular goods hitting a five-year peak in some instances, and manufacturers turning partially to non-oil field goods in keeping plants operating.

Taking a realistic and hard-headed approach to successfully compete in this crisis, suppliers have tightened credit extensions and foreclosed on rigs . . . eliminated marginal stores and centralized warehousing . . . emphasized training to do a better job with fewer, more qualified personnel . . . and automated administrative procedures.

The nearly $200,000,000 in accounts receivable loaned by suppliers to the drillers and producers of oil have taxed supply funds to the limit. Further restrictions in negotiating loans can be expected, since credit losses have begun to multiply and collections are generally running slower.

Suppliers have a definite role in the future of the oil industry, and these steps have been necessary for them to survive and continue serving the oil industry. When viewing the approximately 1.5 billion dollars worth of oil country goods sold by the entire supply industry last year, it is difficult to comprehend the low profit realized.

Last year, members of the Petroleum Equipment Suppliers Association received only 1 percent profit for their efforts. As low as this is, it represented an increase from the 0.1 percent received in 1958! Profits declined steadily from the 3 percent PESA members received in 1950.

Domestic suppliers foresee severe attrition within their ranks resulting from this profit status.

How the operator, contractor, and their suppliers can work together to improve this situation was discussed in interviews with a cross-section of experienced supply company managers and top executives in the oil field supply centers of the nation. This presentation by The PETROLEUM ENGINEER compiles their views to show how the supply industry stands today and portrays the services they perform for the petroleum industry.

Tremendous Stocks . . .

Oil field suppliers in the United States have invested $175,000,000 in stocking their stores. Steel companies provide a total of $300,000,000 in oil country in-transit stocks, including from $75,000,000 to $100,000,000 worth of in-transit tubular goods stocks.

Supply company groups operate over 1000 stores all over the world, with an average inventory of about $150,000 per store. There are 70,000 different items listed by suppliers.

If each operator or contractor would carry his own stocks, he would have a higher investment than a distributor maintaining central stocks. The user would have to have parts on hand for every possible emergency.

Operators would have to warehouse merchandise for a much longer period of time. "Selling the whole field allows suppliers to turn merchandise much faster and it costs less money than it would to have parts sitting two or three years in a company warehouse freezing capital," a supply manager said.

Since operators don't have to maintain the tremendous warehouses that would tie up their capital, they can do what they know best . . . drill the wells and produce the oil. Suppliers perform the function that they know best . . . purchasing and warehousing oil country materials.

Improving Methods . . .

All suppliers, large and small, have faced the tough situation confronting operator, contractor, and supplier alike with tremendous efforts toward improved efficiency.

Suppliers have adopted "economy

Suppliers serve their customers using modern merchandising in air-conditioned, neatly maintained facilities. Goods flowing over these counters and delivered to rigs and well sites amounted to a billion dollars last year. Different companies operate over 1000 stores in U. S.

from within" as their motto in developing the most efficient operation possible.

Earlier over-optimism in putting supplies on location has been reviewed and marginal stores have been closed in an evolutionary process toward centralized warehousing.

Using advantages offered by modern transportation, "super-stores" with large inventories have been erected. This plan calls for leaving only materials for bare emergencies in the field store. The large-scale operation of these stores gives operating economies. Overhead cranes and fork-lift trucks facilitate handling materials.

Other improvements and innovations within the past few years have aided suppliers in serving the petroleum industry.

Automation in handling office procedures has been almost universally adopted. Systems process administrative data entirely for many supply companies, and some have automated inventory control of stocks.

"We feel that it is a necessity to secure reporting information that would be very costly if done manually, and would require a tremendous amount of time," one of the supplier group commented.

Forms have been reviewed and simplified where possible.

Training, evaluating, and properly placing personnel have been foremost in the minds of supply managers. Factory and store training programs have yielded beneficial results for the companies. "Training costs tremendously, and it takes several years before results are realized from training, but it has given us more effective people . . . and people make any organization," a supply manager said. "Putting the right man in the right job in the right location under good working conditions has been our objective," he said.

Expanding Abroad . . .

Suppliers looking toward expansion into foreign markets don't find much encouragement. "The bloom is off foreign operations," a supplier commented.

Uncertain political conditions, undesirability of acquiring "soft" currency in some areas, and competition from European and Japanese manufacturers were cited as deterrents to expanding across the seas.

Because of these conditions, the potential profit often isn't worth the risk.

Most have gone into foreign operations in varying degrees, however, with export sales efforts. Suppliers continually explore field conditions in other countries to expand their market.

"Generally speaking," the domestic suppliers maintained, "the United States market produces the finest quality and the greatest quantity." Lower costs with quite often very good quality sometimes give foreign manufacturers the edge though, they conceded.

Some foreign governments also guarantee their manufacturers' credit risks. This allows extension of credit for longer periods of time than commercial companies can offer.

"There is an increasing tendency toward package deals in foreign shipments," a sales executive said. "It is highly desirable that all foreign-shipment rigs be rigged up in the United States where there is access to the necessary engineering staffs, parts, and experienced labor. This makes it easier to see that everything fits and will function than if it were done on the coast of Africa."

Reviewing the profit picture of the oil field supply companies reveals these figures. A report to the Petroleum Equipment Suppliers Association showed that during last year, 20 of their 31 supply company members rang up total sales amounting to $873,000,000 in 1959. Total sales of all supply companies in the nation during that period exceeded one billion dollars.

This included $409,385,000 in tubular products, and $464,312,000 in non-tubular products.

How much of this was profit?

Gross profit on all products amounted to $106,841,000. Take away operating expenses of $90,228,000 and this leaves $16,613,000 profit from operations before federal income taxes. Reduced to percentages, profit before taxes was only 1.90 percent for the year.

Profit after taxes throughout the industry for the year was estimated at one percent. This low return is causing some investors to withdraw funds from the supply business that is so vital to the well-being of the petroleum industry.

Suppliers constantly battle to show a profit while operating with a limited mark-up and continue the never-ending fight against obsolescence within their inventory.

An extensive and impartial survey conducted recently revealed that too many customers, observing the fabulous investment and sales volume of the supply industry, assume that it

Stocks in oilfield supermarkets provide for oil men's needs at a moment's notice through modern transportation facilities. Store inventories stocked by domestic suppliers amount to $175,000,000.

must be a very profitable industry. Under present conditions this is far from being true.

The oil field supply industry has a record through the years of being liberal in paying claims. Tighter control on paying claims can be expected for the future, however.

Cases involving inadequate maintenance of equipment were mentioned as a primary cause of unjust claims. Investigations have shown that 50 to 100 wells were operated with one or two pumpers . . . failures resulted from operating wells 24 hours a day in nonprorated areas . . . and other claims resulted from wells that hadn't been checked in three weeks.

Drill pipe failures resulting from excessive loads being placed on the bit were cited, along with a long list of other improper operating practices that resulted in claims.

Trade-ins of junk equipment and swapping other items of equipment than that being bought has increased in the present buyers market, along with hard bargaining. Some drilling rigs have been sold at a close margin of profit to hold a good customer, and pumping units have been sold at a loss.

Extending Credit . . .

Suppliers function also as bankers to the industry on equipment and materials, and almost all sales are on a charge-it basis. "Companies can't expect suppliers to carry the burden anymore," a high official said. "Credit extensions have taxed our capacity to the limits."

Suppliers don't intentionally provide business advice, but it comes in the normal methods of doing business. In order that the supplier finance the customer, various financial reports must be investigated. Based upon extensive over-all knowledge of the business aspect of drilling and producing oil wells, the supplier can often provide information that had not been previously considered. In this way, both supplier and customer have a better chance of making a profit.

Banks don't make loans on equipment unless the customer can back the note with production holdings, which leaves suppliers to carry the burden.

Service Beyond Duty . . .

Historically, the supplier has performed the unusual for the operators as an everyday way of doing business.

The supplier has always been on-call at any hour of the day or night to meet the sudden, acute needs of drilling and producing oil. Suppliers consider extraordinary demands placed upon him as a routine part of his job. A supplier once drove 900 miles round-trip to secure a clutch plate for an operator drilling near the Alaska Highway in Canada!

Such instances occur frequently in an industry which operates in remote places.

To the supplier, the call of duty is very broad. In case of emergencies, store and field personnel willingly work around the clock and in all kinds of weather. It is a tradition that wherever oil men go, suppliers go with them.

Field men have served customers in the frozen wastes of the Yukon Territory and in the jungles of Papua, as well as in hundreds of other distant, isolated locations.

From the Beginning . . .

Beginning in 1859 with the Drake well at Titusville, Pennsylvania, early suppliers hand-forged tools to meet the needs of drilling this first well. Several years later, in 1862, a supply store was established in Oil City, then at Pittsburg in 1894. An early store was founded in Texas at Corsicana in 1897.

Oil field supply stores and their method of operation developed in a fantastic atmosphere of boom or bust. In the early years, new stores were opened and old ones closed rapidly.

One supplier's first shipment to a store never reached its destination — eager buyers bought it up at the railroad depot.

The familiar two-story frame building next to a railroad track had a porch and a false front to make it look larger. The road in front of the building was dusty in good weather and muddy in bad. Equipment and supplies were stacked high around the sides and back of the store.

The early supply store was a familiar sight wherever oil was found in the early days — in Pennsylvania, Ohio, Kansas, Indiana, and Oklahoma.

During the Spindletop boom at Beaumont, Texas, wells were being drilled so close that legend had it that a drill string could be lost in one hole and fished up out of the well next to it. The demand for available equipment was tremendous, and supply store men had to work around the clock, catching an occasional nap on a cot in a corner.

Supply stores were often the first structure built in many of the early fields. They became the center of community activities, serving as post offices, employment agencies, hotels, and even as hospitals. One early store in Oklahoma had the only bathtub in town.

Aiding the Operator . . .

Suppliers aid the operator by selecting the best products to offer from among those available. They develop and manufacture more and more specialized equipment meeting the challenge of advancing technology.

Through field engineers, suppliers have constant daily contact with trends and requests from operating and design engineers. It is through this cycle that new ideas are created and new developments brought into being.

Larger suppliers maintain staffs of bottom-hole pump men, sucker rod specialists, and electronics specialists. Many also have secondary recovery staffs — engineering designers and draftsmen to supervise construction.

Among these services are facilities for doing turnkey waterflooding jobs.

These staffs survey the operator's property to determine his requirements. They carefully design all units for the entire job and install them.

These specialized services must be contained in the operating expense of the supply company. This subjects them to sniping from shoe-string competitors whose investment and services are limited to the desk and telephone, enabling them to pass along part of his mark-up to the consumer and still make a profit.

There is a tendency of major purchasers to forget the diversified services offered by the supplier.

Field service in installing and repairing equipment provides operators assurance that it will perform the job intended. As specialists in their own equipment, with the proper parts to complete the job, suppliers' service crews keep equipment running properly.

Research and Manufacturing . . .

Through engineering and research efforts, suppliers seek constantly to improve their products and develop new ones. Suppliers have contributed immensely to the development of basic systems such as rotary drilling that have become widely adopted in drilling and producing oil.

Suppliers operate a wide variety of plants for machinery and pumping units, wellhead equipment, drilling rigs, slush pumps, tool joints, and torque converters.

Pipe mills make drill pipe, casing, and tubing for the oil industry, and also drill collars and sucker rods. Others manufacture welded pipe and electrical conduit.

Order-placing with the suppliers has been speeded by teletype systems relaying information. In addition, many operate radio-equipped cars for rig calls and for speedily placing orders.

In domestic and some foreign locations, short wave radio systems link stores and division offices.

Modernizing Stores . . .

The supply store itself represents the changing aspect of the business. Modern stores have become a scientifically managed merchandising enterprise.

There has been a modest revolution in the oil field supply store and considerable advance in its service and functions.

Intensive store modernization programs aim for faster and more efficient service to the customer. Appearances of the store have been made pleasing, costs have been reduced through streamlining and standardizing. This long-range project has been carried forward with expert architectural consultants and designers advising changes.

It costs suppliers money to maintain equipment and personnel to operate store warehouses. Overhead cranes and fork lift trucks speed handling of oil field materials, providing greater efficiency.

Typical modern store is a low one-story, with plenty of window space. Generally, it is situated on a main highway in an oil town, and it has ample parking space. A corrugated iron warehouse with at least 5000 sq ft of floor space is attached. One or two acres of storage yard surround the store.

Inside the store are modern show cases, fluorescent lighting, padded stools in front of the counter, and perhaps a coffee bar in one corner for the convenience of customers.

Showcases, shelves, and windows attractively display merchandise. This would normally be hand tools, paint, flashlights, electric bulbs, safety helments, and other items.

Bulkier merchandise is stored in the warehouse, and other items such as heavy machinery are stored in the yard.

Stores adapt to special demands of each area, and air conditioning prevails in warmer climates. Stores sometimes provide unusual services such as Geiger counters near the front door in uranium-prospecting areas; and products such as special anti-freezes and starter fluids in the far north.

Supply stores carry oil field libraries with give-away literature displayed in racks. The permanent store catalog includes a vast store of information relating to oil well drilling operations.

A typical store staff consists of the store manager, an assistant manager, several sales clerks, warehouse men, field representatives, repair men, drivers, and clerical men.

In district and division offices the stores have available product specialists, credit experts, and other specialized personnel. Often, special services are rendered by personnel from the supply company headquarters.

Suppliers strive for modern, clean, and efficient stores without becoming so fancy that an oil man wouldn't feel at home in his working clothes.

Incentive for Cooperation . . .

The tremendous role that the supplier plays in the success of the operator should provide incentive for working out mutual problems to the advantage of both parties. Certain conclusions may be drawn as to how the suppliers' condition affects the operator.

The possibility exists that factories ordinarily turning out needed oil field materials and equipment may be converted to military and other types of production, thus taking it out of service in the event of increased demand from the petroleum industry.

Operators can expect to pay more cash for purchases since lack of funds will prevent suppliers from extending credit. They can expect an intensified sales effort from salesmen trained to fit their products to the customer's needs. More thorough investigations of claims could also result as suppliers become unable to continue lenient payment practices.

The petroleum industry and their suppliers depend upon each other, and neither can succeed without the other. In the coming years they will work together closely to solve their common problems and continue producing the nation's petroleum. ★ ★ ★

L. B. MEADERS, *President,*
Halliburton Company, Duncan, Oklahoma

SERVICE COMPANIES SERVE YOU WELL

An integral part of oil and gas drilling and producing operations . . . from the time of spudding a new well until it is plugged and abandoned . . . today's service companies provide operators with vital service at the lowest possible cost

BEGINNING WITH the spudding of a well, service companies play a large role in vital oil and gas operations. Teaming up with drillers, superintendents, and engineers, service companies perform many duties and they are continually developing new methods and improving present techniques to help safeguard the producing life of every oil and gas well.

Technical services performed during oil well drilling, completion, and workover operations are of a highly specialized nature. The types of service and equipment needed not only vary from well to well, but vary widely during the time the well is being drilled. Because it was impractical for each oil company to maintain the necessary staff, equipment, or vast inventory of supplies to meet the demand for a particular service, the specialized service industry was born.

Basic Services Performed

Service companies provide specialized services to the drilling and producing segments of the petroleum world and probably the first service offered to the industry on a broad scale was the cementing of casings in oil and gas wells. This was introduced by Erle P. Halliburton to the Mid-Continent and Southwestern areas in 1919. Other services offered to the industry by service companies include drillstem testing introduced in 1926, electric well logging in 1928, bullet gun perforating about 1932, and acidizing about 1932. Cement retainers appeared in 1936, bulk cementing in 1940, jet perforation in 1946, and hydraulic fracturing in 1949.

While this outlines some of the basic services, let me emphasize that techniques, tools, materials and equipment are constantly being revised to help meet the changing conditions of the oil industry. Most of these services could be performed by producers themselves, but for various reasons they have come to depend upon service companies to do the job.

In the first place, service companies perform the same jobs day in and day out. This means they will naturally develop better ways of doing them. Because they are continually doing the same jobs, they build specialized equipment designed to do the job the best way possible and by the most economical method.

Since our principal business is service, our employees are our most important asset. Skilled operators represent the various companies on the jobs and engineers and chemists must understand drilling and production problems in order to improve service equipment and techniques. Without a highly trained employee organization, specialized equipment would be useless and few new developments would occur.

Thus, you have both men who are skilled in a particular service and equipment designed for a particular service.

Other Services

So far, I have mentioned only physical things, men and equipment. Let's say something about an equally important, but sometimes overlooked fact: A service company concentrates all its time, talent and facilities on its services, resulting in a single-mindedness of purpose that would be lacking in any organization where service is an auxiliary operation. You can't measure this advantage, but it means better service to the industry.

Another consideration is the concentration of equipment that these companies can give in case of emergency. Any number of wells have been kept under control when they were threatening to get out of hand by emergency calls to service companies. The equipment was massed and delivered to the well in distress. Without such an organization, this aid would not be possible, since no one operator would have all

the specialized equipment necessary to fight troublesome wells.

The service company also brings you an ingredient that absolutely cannot be saved up . . . time! Time is the heart of a drilling operation and here service companies are again valuable to the oil operator. Geared to provide quick service, geared to cope with emergencies, they help save time when it is in short supply.

These points boil down to this: The service company's part in the petroleum industry consists of putting skilled men and special equipment where and when the industry needs them and doing so at reasonable cost.

Service Company Goals

Service is truly a part of the lifeline of the oil industry. Service companies strive to aid the industry in many way, among which are rendering useful services at reasonable prices, giving uniform quality of service, carrying on a never ending program of energetic research and constantly developing new equipment.

These companies also attempt to serve the oil operators in all areas and under all conditions. Therefore, they must maintain a tremendous inventory of equipment: They must be equally ready to competently service the 1000-ft well in eastern Kansas or the 18,000-ft well near Corpus Christi; and must be prepared to operate in offshore waters, along the coast line of the United States or in countries abroad. Services are offered in foreign countries in the same manner as in the U. S. The products and equipment of a service company are available 24 hours a day, 7 days a week, because the need for them may arise at any time . . . day or night. Service facilities must be located at all gas and oil areas so equipment will be accessible to the customer wherever and whenever needed. One truck may perform ten jobs in one week and then remain idle for several days. Ours cannot be an assembly line of business.

Due to the transient nature of drilling operations, fixed communication facilities are extremely limited. Yet it is in these areas where the need for fast communication becomes of increasing importance due to the hazard and cost of drilling operations. To obtain this communication, service companies have installed thousands of mobile radio units which communicate with base stations installed at many field camps and warehouses located throughout the oil field areas. These radio systems provide a means of routing equipment on to the job site, transmitting calls for additional aid and in hundreds of cases have provided means of summoning aid in the event of accident.

A measure of the importance of radio communication to the supply and service industries is demonstrated by the fact that the world's largest privately owned mobile radio system is operated by an oil field service company. This system, consisting of 150 powerful base stations throughout the United States and over 1700 radio transmitter receiver units installed in vehicles, provides instant communication 24 hours a day over an area of some 40,000 sq miles.

Service-Operator Teamwork Important

We've established that the service company fills a definite need in the industry, and has certain duties and obligations to the industry. Now let us look at the common obligations which exist between the operating company and the service company. Many of the services performed by these companies reveal information for the exclusive use of the customer. To prevent a conflict of interest between the service company and its customer, most of the service companies do not engage in oil or gas leasing, developing and producing. Founders of some service companies showed great foresight by including in their charters clauses which specifically prohibit any engagement in such activities.

When a service company is called upon to perform its operation at a well, it must have the complete cooperation and confidence of the well owner. There is a high degree of teamwork necessary for a successful service job. Large quantities of material and specialized equipment and quite a number of skilled men must be assembled at the well site and temporarily welded into a coordinated unit at a specified time. The well owner's employees and the drilling contractor's crew and equipment become a part of this unit until the operation is completed.

Frequently, a service job is a problem in logistics before it becomes a problem of execution. The correct move at the correct time, the proper equipment in place and ready to operate, plus many minor details, must be arranged. The failure of a single unit or individual to perform as required may jeopardize the entire operation. Adequate overall supervision must necessarily be furnished by the well owner. And his representative should be a capable man with the authority to make decisions on the spot.

The service company has the duty to furnish the operating company with complete data as to the manner in which the service will be conducted. This should include any unusual occurence expected and a clear record or resume of information obtained if the operation is designed to gain knowledge of the potentially productive formation.

Service Company Research Activity

In speaking of other activities of the service company, I want to discuss research — and I want to discuss it with pride. It has been said that research is the heart of an industrial organization. I believe this is especially true in a service company. Whether it's extending and perfecting existing services and products or developing entirely new ones, the service company with a future has an extensive research program.

Research by service companies has closely paralleled the ever-growing complexity of oil production. Mr. Hughes, we are told, conducted his first bit experiments in a garage; Mr. Halliburton's first research assistant was his wife. This was about the time the industry was moving away from creekology and divining rods. Today, the laboratory and engineering facilities of a good service company can, I respectfully submit, compare with those of the major oil companies. The proportion of service company personnel with bachelor and advanced degrees is, we believe, impressive. In addition, each good firm puts its personnel, especially its operating personnel, through service schools. These schools give our people both theoretical and practical knowledge.

Incidentally, I would like to emphasize that the entire petroleum industry can take pride in a characteristic of petroleum industry research that is not always found in other fields — recognizing the community of interest, sharing the fruits of research among the entire industry.

I mentioned earlier how only a service company can provide the concentration of equipment an oilman needs in an emergency on his well. The same things hold true in research. It is difficult for an oil company to economically justify the research that relatively minor, though important, improvements entail; but the service company with thousands of well assignments a year can take the little improvements, work with them, study them, test them and finally introduce them.

As to the big changes in oil well service, many of these, too, come from your service companies. But not all, of course. Let's look at two major technical advances, one originated by a service company.

First, consider fracturing. This was originated by an oil company. Before it became a commercial process, offered

to all oil producers, its scope was relatively limited and the process was complicated. Research by service companies expanded and further developed fracturing. New variations, new techniques, began to come fast and furious. A number of service companies entered the field. What one didn't think of, the other did. Fracturing has given new life to old wells, and has transformed many non-commercial producers into good wells.

Another advance, originated by the service company with which I am most familiar, is bulk cementing. A number of years ago, all cementing jobs used sack cement. Then a man had a bright idea! Why not handle the cement in bulk all the way from the mill to the well? Technically, the idea was obviously sound — bulk cementing would make for better cement jobs. But the cost of such a system was almost prohibitive. Nevertheless, the service company proceeded. A large capital investment was required. The bookkeeping on the project used only red ink in the early years, until a complete bulk cementing system was in operation. Only a service company would have found it feasible to introduce bulk cementing. Again, I point out that no one oil company would have drilling operations widespread enough to justify doing so.

These two examples are practical end products of research – research with the ultimate purpose of helping to produce more oil and gas at less cost.

Much research not directly connected with a service is conducted by service companies. Some of the current projects, for example, include experimental air drilling to help solve an industry problem — shutting off unwanted fluids. The study of plastic flow of salt strata is being made to help prevent the collapsing of casing. Many service companies are working on projects that will be of much benefit to every producer of oil and gas. The information gained from these projects will help the entire industry, not only the service company involved.

A service company must look ahead, sometimes quite far ahead, to anticipate the need of the industry. One service company is now engaged in testing a gas turbine engine as the power source for its fracturing pumps. Probably it will be several years before this engine or a similar engine is put into commercial use in the oil fields, but the groundwork must be laid at this time in order to be ready for the future.

A project that is even more in the future, is the proposed 50,000-ft well that might pierce the earth's crust. Here is a task that will challenge the best minds of the industry. Yet some of the required equipment and service products that would be required are already on the drawing boards.

Research Results Are Publicized

Following on the heels of extensive research programs, service companies also have the responsibility of placing the results of this research before the industry where it may be viewed and evaluated as to the good it will be to the operator. All new facts and techniques must reach the operator.

One mode of introduction, of course, is through advertising channels, some of which consist of brochures dealing with special services, tools and materials. To be effective, clarity, conciseness and absence of exaggeration should predominate.

One of the best avenues for dissemination of new knowledge is through papers given at meetings of such organizations as the AIME and API. Therefore, each service organization has engineers who are members of such groups. These service engineers prepare reports on the latest developments by their companies and present them before these organizations. Only those that are judged to be contributions or improvements compatible with the aims and rules of the society are accepted.

Most service company engineers are adept in the performance of several services, and have many responsibilities and chances for varied experiences. One of their duties, however, is never to assume that a busy operator has or oil company engineer has read the latest digest or used the most recent improvement. He takes this news to him at his first opportunity.

Service companies always participate in the annual oil shows held in various parts of the country. Trained representatives of the company explain to visitors all the latest devices which the company has developed and some of their plans for the future.

Another phase of contact with the industry which the service companies have developed, is to encourage customers to visit their home offices to see what the particular problems of the service industry are and how they are meeting them.

Problems in Transportation

Many transportation problems are encountered by the service company. Although the equipment travels a great part of the time on rural roads, it is still subject to size and weight limitations as handed down by various administrative authorities of the several states. With the building of equipment to handle large volumes and higher pressures, space and weight limitations present real problems that companies must continually strive to overcome. The need for service companies to haul heavier equipment has increased to the point that light weight materials of all types are considered and used in present service company rolling stock. The problem is one that requires constant study by engineers and technically trained men.

Developing Service Personnel

Our greatest potential shortage in the service industry, and in many other industries, is educated and trained people. Nor is this unpleasant truth a recent discovery. Alfred North Whitehead summed up the situation for our times as long ago as 1917 when he wrote: "In the conditions of modern life the role is absolute. The race which does not value trained intelligence is doomed. Not all your heroism, nor all your social charm, nor all your wit, nor all your victories on land and sea, can move back the finger of fate. Today we maintain ourselves; tomorrow science will have moved forward yet one more step and there will be no appeal from the judgment which will then be pronounced on the uneducated."

The oil industry, including the service company, caters to the support of college and educational institutions in many different phases of training and this is of utmost importance to the advancement of the industry.

The people who staff the service companies are conscious of their duties as good citizens; and in a corporate sense the companies themselves are conscious of their responsibilities to the communities in which they operate.

As stated previously, the well trained employee is the company's most important asset. In the specialized business of petroleum service, a competent field man cannot be developed to this status quickly or easily. Every responsible service job requires many well developed talents and service company managements allocate a large amount of time and money to keep its personnel informed on new developments and competently trained for every assignment.

In Summary . . .

Service companies feel that they are working with the producers of oil and gas to the best of their experience and research to keep the American oil industry the vital, dynamic thing that it is. When the hydrocarbons that are found, produced and changed into so many thousand different items reach their end uses, the service companies take pride in the part they have played.

★ ★ ★

MODERN DRILLING EQUIPMENT

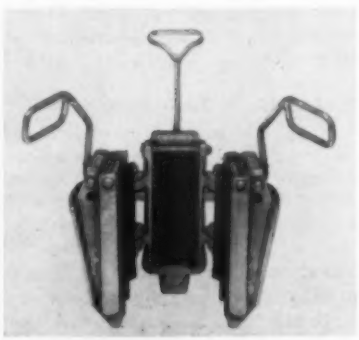
Rigs and Equipment

Mud-Air Rotary Drill

201 A new truck-mounted, combination mud-air rotary drill — with a 3⅜-in. fluted-type, 18-ft kelly, a 1½-in. water course swivel, and a cast steel yoke — has been announced for seismograph and exploration work, as well as shallow production. A continuous-type chain feed pull-down, powered through a dual range hydraulic system, affords infinitely variable control over pressure on the bit. Cuttings are removed by air or mud, augmented by a single-stage 485-cu-ft-per-min compressor or 5x6 mud pump respectively — V-belt driven from the PTO unit. Heavy-duty features of the small, compact 10-R include: split-type power takeoff with individual friction clutch drives for all main machinery; a double-drum drawworks with sturdy, long-life brakes and clutches; spiral bevel gear rotary table with 4-speed forward and reverse drive; pipe storage rack; hydraulically raised and lowered steel mast constructed of square tubing; and self-adjusting built-in breakout wrench. *Bucyrus-Erie Co.*

Light Weight Slips Durable and Strong

202 For greater efficiency, lighter weight, and longer life, Mission Manufacturing Company has introduced a new slip design for use on any size pipe from 2⅜ to 5 in. The 135-lb slips have hook load rating of 275,000 lb. High capacity attributed to pipe-handling dogs which almost completely surround the pipe and prevent bulging between segments. Other features include new hinge pins with replaceable bushings to permit economical renewal when hinges are worn. Hinges designed to allow up to ¼ in. total movement between segments either vertically or horizontally. This permits compensation for bowl wear and for the pipe being off-center with the rotary. *Mission Manufacturing Company.*



Dual-Weight Drill Pipe

203 Pittsburgh Steel Company is producing dual-weight drill pipe which involves the redistribution of steel in the pipe to preserve the strength advantages of heavy drill pipe without incurring additional weight or expense. The pipe has not less than 4 ft nor more than 6 ft of heavier wall thickness at the box end. This gradually and uniformly tapers to a lighter weight body wall, providing an integral combination of heavy duty upper end blended into a lighter weight body. External dimensions conform to API standards and both ends are upset for application of API weld-on tool joints.

While reducing the weight per ft of drill strings, the pipe extends the capacity of regular weight strings 18 to 32 percent with the same safety factor at the slips. Redistribution of the steel in dual-weight drill pipe gives extra strength in the most vulnerable area of drill pipe—the 4 ft which make contact with the slips. *Pittsburgh Steel Company.*

Tubular Derrick Added

204 An 86-ft tubular derrick has been added to the Fred E. Cooper, Inc. line. Equipment, designated W-86, has alloy steel tubular legs and is rated at 155,000-lb capacity with a four line string up. Derrick is raised by a single hydraulic ram and unfolds by two hydraulic rams. Depending on needs, it is offered with a telescoping upper section rather than the standard folding upper section. The hydraulic system is designed to power hydraulic rod and tubing tong gear. Unit is capable of pulling and handling tubing in doubles in areas where tall wellhead or blowout equipment is no problem. *Fred E. Cooper, Inc.*

All-Electric, Medium-Depth Rig

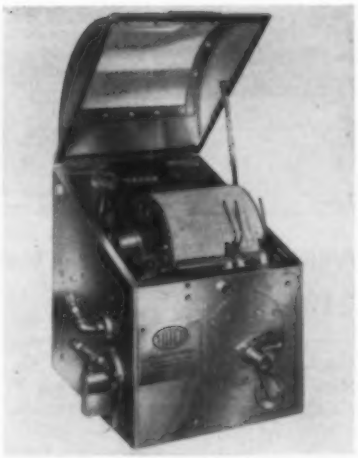
205 Reduced rig-up time, lower power consumption, and easier maintenance are features of a new all-electric, medium-depth rig engineered by Mid-Continent Supply Company. The rig is designed around a 2-speed hoist built for torque converter or electric power and designed for drilling depths requiring from 300 to 600 hp. The rig has a high degree of flexibility by having engine-generator sets assignable to either or both motors. When the generators are split — one to the pump and one to the rotary — respective throttles control speeds independently.

Driller has a choice of 4 rotary speeds for any given pump speed. He can divert maximum power from both engines to the pump with a proportionately smaller amount going to the rotary. With either engine down, the driller can come out of the hole with approximately 27,000 lb single-line pull in "low." It is also possible to rotate and circulate at reduced power with one engine. *Mid-Continent Supply Company.*

Programmed Hydrocarbon Detector for Mud Logging

206 Core Laboratories, Inc., has developed a simplified, single-column chromatograph for use in on-location mud logging service. Called P/H/D (programmed hydrocarbon detector) the instrument utilizes a technique of "back flushing" gas samples from the drilling fluid. The operator receives total gas data in selected programs, component by component, in rapid sequence. The unit can cover the complete range of total gas, from methane through pentanes, in only 6 min.

The unit can distinguish between non-commercial "background" materials, such as shale gas, oil-type drilling fluid additives, etc., and virgin shows. The 120-lb instrument measures 22 by 21 by 15 in. *Core Laboratories, Inc.*



New Drilling Recorder Improves Work Efficiency

207 A drilling recorder that delivers 3 readings simultaneously — penetration rate, drill string weight, and torque or pump pressure — is available through Technical Oil Tool Corporation. The instrument measures penetration rate mechanically, providing precise data on time elapsed for each foot drilled, total depth, formation changes, drilling time, and downtime. A unique hydraulic system provides readings — in thousands of pounds — on total drill string weight in suspension, eight on bottom, and changes in weight. System also determines torque and indicates locked cones and other factors affecting torque.

Instrument records all operations on one permanent, easy-to-read chart. Resulting information can be used to provide information for more intelligent bidding and for planning future drilling programs. Recorder is available on a daily rental or term lease basis in this country and is offered for sale in export markets. *Technical Oil Tool Corporation.*

V-Belt Drive Improvement

208 Considered a solution to space problems on oil industry high horsepower applications is a new high capacity V-belt developed by Gates Rubber Company. Sheaves are only 28½ in. wide, compared with conventional 46-in. size, enabling use of 38 percent less space and well within practical drive limits. Development, which makes V-belt drive practical for giant mud pumps, is result of a 10-year research project and has been called a top contribution to oil industry power transmission. *Gates Rubber Company.*

Weight Indicator For Small Rig

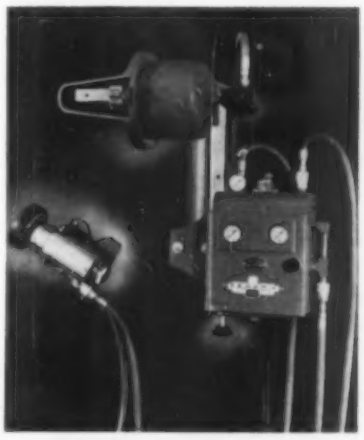
209 The Martin-Decker Type G weight indicator has all the features of the company's larger indicators but is scaled down to provide the small drilling rig, workover or production hoist with all their advantages but at a size and weight scaled to the portable units. The combination anchor and weight indicating device provides a unique method of transferring the load on the line to an indicator mounted near the driller or operator. It is a compact package that becomes a permanent fixture on the rig.

The Type G incorporates the Sensater as the weight-sensing device to provide a completely frictionless load cell system essentially unaffected by temperature and of extreme accuracy. *Martin-Decker Corporation.*

Automatic Drilling Control

210 The Geodril automatic drilling control instrument, manufactured by The Geolograph Company, is an easy-to-operate weight control device which may be used on any rotary drilling rig equipped with an air supply of 20 psi or more. The control automatically senses the need for change in bit weight, raises the brake handle, and allows more line to feed off the brake drum.

Safety control devices are incorporated in the Geodril to assure safe control of the brake. Twist-off and weight control safety measures are present to block the air supply and vent the air to the atmosphere should a failure occur. Other safety measures include a control against over-feed of the drawworks which is incorporated as a compact unit attached to the existing drawworks. Loss of air pressure will immediately set the brake. The drilling may at any time take over manual operation of the brake by merely removing the flexible control line from the brake handle. *The Geolograph Company.*



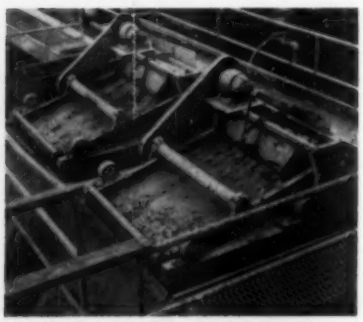
Weight Recorder Line Offers Peak Efficiency

211 Now in production at Geolograph Company is a new line of recorders designed to provide a record of weight, torque, or pump pressure through a dependable hydraulic system. Instruments show slightest changes in drill string weight, weight on bit and torque or pump pressure on a convenient chart, providing a graphic picture of subsurface drilling conditions. This record can be quickly checked at any time to determine desired drilling weight, verify formation breaks and reduce bit wear.

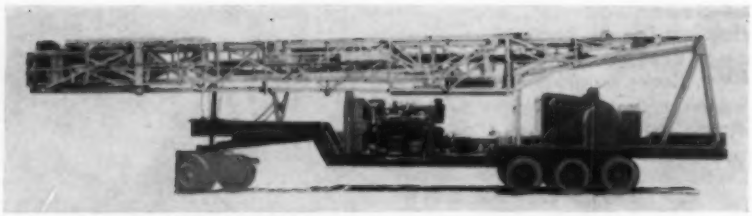
Three models are available, all recording weight in thousands of pounds. Model G3W features a chart 3½-in. wide with a scale of zero to 350,000 lb; G4W utilizes chart 4½-in. wide with scale of zero to 400,000 lb. A chart 7-in. wide is used by G7TW and G7PW models and records up to 450,000 lb. In addition, either torque or pump pressure recording is supplied on these models. Over 30 different charts are offered to provide recording tailored to particular needs. *Geolograph Company.*

Vibrating Rotary Mud Screens

212 Overstrom and Sons, Inc., has announced several design and construction modifications which are adaptable to the firm's line of vibrating rotary mud screens. New features include a larger unitized vibrator cartridge assembly, oil-bath lubricated for longer life and easy cold-weather starting, and easily removable for service or replacement; a bolted deck-to-frame



construction to provide faster screen changing; and the use of a special snubbing device to cause the machine to come to a smooth, quiet stop when screening is halted. *Overstrom & Sons, Inc.*



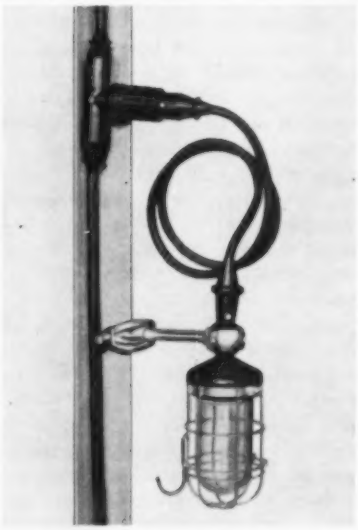
Drilling Rig Offered Single Engine Portable

213 A portable drilling rig capable of cutting to 5000 ft with 4½-in. pipe or to 8500 ft with 2⅞-in. pipe has been developed by Mayhew Machine & Supply Company. Powered by a single engine, unit utilizes propeller-type drive shafts rather than conventional chain drives to rotary table, slush pump, and transmission. Drawworks, rotary, engine, and pumps are integrated into a single substructure trailer, eliminating weight of skid mounting.

The 94-ft mast is capable of racking 9700 ft of 2⅞-in. or 5400 ft of 4½-in. pipe. Input horsepower rating is 400 to the drawworks.

The unit becomes an efficient air drilling rig when the mud pump is replaced with an air compressor. *Mayhew Machine & Supply Company.*

Neoprene Assemblies For Rig Lighting



214 Oil derrick String-A-Lite has been completely redesigned, with various stocked assemblies offered in combination to form easy-to-install, corrosion-resistant vapor-proof lighting sets tailored to fit rigs using any popular mast or derrick and to remain in place if desired while unit is in transit. All-Neoprene latching connectors are combined with new compact floodlights, proved molded Neoprene handlamps, and new adjustable mounting clamps to provide flexible rig lighting. Another feature is special heat-treated glass that is not affected by abrupt temperature change or chilled water spray, even after extended periods of operation. All-Neoprene assemblies are said to completely resist oil and acids, water and ice, dust and dirt. *Electrical Products Div., Joy Mfg. Co.*

Drawworks Line Range Extended

215 A new GD-1500 drawworks line for drilling in the 12,000 to 20,000-ft range has been added by Gardner-Denver Company. New offering is designed for fast, economical drilling capable of single line pull of more than 95,000-lb. The housing, made of 1-in. steel plate reinforced at stress points, contains hoist and transmission in one unit, providing portability. Working parts are totally enclosed for maximum safety.

The drum core is 54 in. long and 31 in. in diam and can spool 3750 ft of 1⅜-in. drilling line. Brake is cooled by circulating water through large, totally enclosed jackets. Adjustment and replacement can be accomplished quickly and easily. An oil tight and spray lubricated case in the rear of the drawworks housing contains the transmission. Jaw clutches, air-actuated for the driller's position, control 4 forward speeds and reverse gears. *Gardner-Denver Company.*

Bits and Tools

Pressure Stabilizer

216 To ease problems of over-taxed pumps and equipment damage resulting from sudden line pressure surging is a new stabilizer now being offered by Skinner Brothers Company. Suitable for use on either suction or discharge side of the pump, the stabilizer is designed to even out the pressure in the line and absorb peak surge shocks. Makeup involves a super-pliable cartridge housed in a tall steel casing. Rated at 600-cu in. capacity cartridge consists of two layers of tension-tested nylon cord sheeted in a Nitrile-based rubber compounded for maximum flexibility, solvent resistance, and durability. It is molded and metal caps vulcanized in a single operation to assure a tight seal. Latest model can handle 450 psi of line pressure. Others are rated at 50 to 100 psi. *Skinner Brothers Company.*

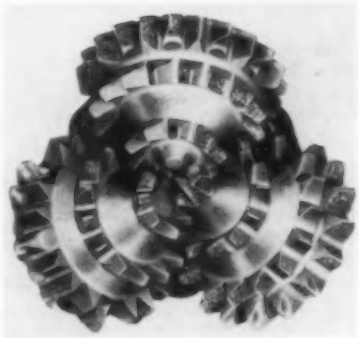
Flowmeter Protects Against Stuck Pipe

217 Protection against stuck drill pipe, excessive mud costs, and blowouts is claimed for a new differential flowmeter developed by Warren Automatic Tool Company. Instrument, consisting of one electromagnetic transducer installed in the mud flowline and another in the mud line between the pumps and the stand pipe records only downhole mud circulation action when it happens. Unaffected by surface operations, it reportedly is responsive to flow rate changes of as slight as 5 gpm.

Transducer signals are received on the derrick floor and flow rates are measured, compared, and recorded on the strip-type chart. A selector switch permits selective checking of the inflow or outflow. *Warren Automatic Tool Company.*

Boosters and Compressors For Air Drilling

218 Now in production at Schramm, Inc. is a complete line of boosters and compressors for air drilling and pipeline testing. Five basic units available can be combined into a number of different packages depending on needs. Air volume is limited only by number of packages utilized; pressures to 1500 psi are obtainable. Boosters can be furnished equipped for power take-off, V-belt, or direct motor drive. Model PPC, capable of boosting air volumes to over 1600 cu ft per min to pressures up to 1500 psi, is furnished on oilfield skid base. Other 4 units are available on wood or field skids, spring mounted on 4 pneumatic tires, or mounted in pairs on low-bed trailers equipped with necessary manifolds, valves, and piping. *Schramm, Inc.*



Rock Bit Introduced For Medium to Hard Formations

219 A new 12¼-in. rock bit designed for drilling the sandy shales and shales alternating with streaks of sand, anhydrite, gypsum and limestone has been introduced by Hughes Tool Company. Tool, designated OWV Tri-Cone, offers faster drilling rate, longer life, and low per-foot drilling costs. Bit is smooth-running with fast-cutting chisel teeth. Average intermesh has been made deeper than the firm's OSQ-2 model and tooth height has been increased, giving the OWV a deeper bite with each rotation and stepped-up self-cleaning action. Full length of the teeth is left free to cut.

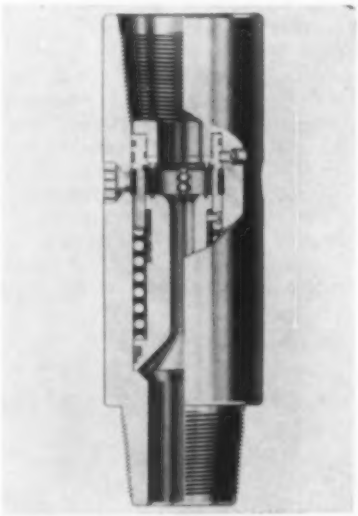
Heel row structure has been revised with ventilation between teeth minimizing packing. More ventilation has been accomplished by staggered interruptions of long heel teeth and removal of alternate inner ends of the intermediate length heel row. Selective application of hardfacing has maintained strength of the ventilated heel teeth. Tool is available with either jet or conventional watercourses. *Hughes Tool Company.*

Key-Seat Wiper Eases Stuck Strings

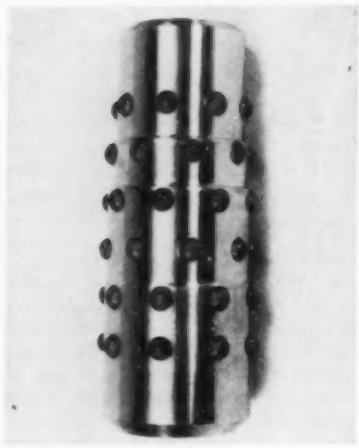
220 Insurance against stuck drill strings resulting from formation of key seats is offered by Grant Oil Tool Company in the form of a new key-seat wiper. The tool, which rides just above the top drill collar, is first to detect the restriction. It then reams them out so that drill collars can move through without sticking the string. The key-seat wiper is composed of two parts: A 1-piece, chrome nickel, heat-treated steel mandrel, and a sleeve-type welded blade reamer made from tubing, split longitudinally and welded around the mandrel. The sleeve has enough room on the mandrel to enable the operator to raise the string and jar down on the reamer until it becomes free. Rotation is then begun as the pipe is slowly drawn back into the seat. A clutch at the sleeve bottom locks automatically to the mandrel so that the sleeve reams out the narrow groove. *Grant Oil Tool Company.*

Jet Bit Bypass Valve

221 An aid in selection of jet sizes in jet bit drilling is a new jet bit bypass valve designed to provide auxiliary openings in drilling assembly above the bit. When run with bits having extremely small jets, valve allows normal fill of the pipe while running in the hole, reducing possible damage to lost circulation zones because of pressure surges. It is in open position while drilling assembly is being retrieved, allowing pipe to drain and reducing swabbing effect of bit being retracted. This also eliminates necessity of pulling wet strings of pipe. Valve is closed while circulating, directing fluid through jet bits.



Outside diameter sizes in inches are: 4¼-4½; 5¾-6½; 7¾-8. *Houston Oil Field Material Company, Inc.*



Knobby Reamer Cutter

222 A knobby reamer cutter designed for use in extremely hard formations such as chert, granite, or hard sand is being marketed by Drilco Oil Tools, Inc. Said to be the only reamer using tungsten carbide compacts, the cutter is designed so that spacing between carbides on the cutter allows the reamer to be run in hole overgage to underream the hole and aid new bit in going to the bottom.

Designed to concentrate the crushing load against formation at the tips of the compacts, the tool is said to decrease overall bearing loads. *Drilco Oil Tools, Inc.*

New Bit Replaces Three Others

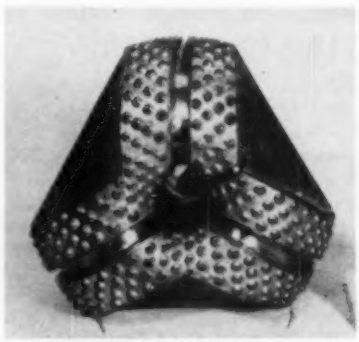
223 A new rock bit that consolidates the superior features of 3 others has been introduced by Hughes Tool Company. It is the Type RG-1J "Tri-Cone" and replaces the Hughes R-1, R-1J, and RG-1. In field performance, the new bit reduces drilling costs in extremely hard, abrasive formations by reducing round-trip time. Sintered tungsten carbide inserts on the gage work as reamers, maintaining hole gage even after the row at the gage point and inner rows of inserts begin to wear. This permits running the bit long after other bits would normally be pulled without the need for additional reaming operations when running a new bit.

The RG-1XJ has the same cutting structure as the RG-1J but features the new Hughes self-lubricating sealed bearing. *Hughes Tool Company.*

Diamond Bit Features New Design

224 A new design for diamond drilling bits is being used in the Gulf Coast region for drilling hard formation below 13,000 ft to depths of 18,500 ft. The bit, designed by Drilling & Service, Inc., is unique in appearance and is referred to as the D&S Truco "Frog-Eye." In one instance, a bit of this type drilled 1924 ft below 15,000 ft at 5.6 ft per hr.

The bit has special application where lost circulation problems occur in con-



junction with pressure compacted formations. A total of 525 ft was drilled in one such well where these conditions persisted at the rate of 2.3 ft per hr. In the same interval, rock bits drilled 19 ft per bit at 1.7 ft per hr. Each bit is custom designed to suit rig specifications and downhole conditions. *Drilling & Service, Inc.*

New Formation Bit

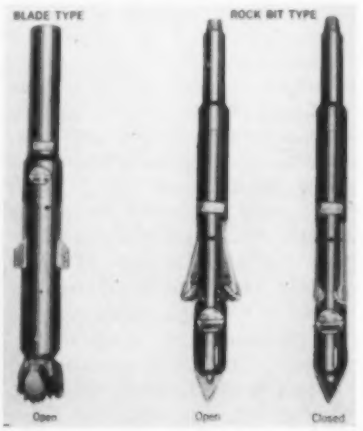
225 Varel Manufacturing Company has designed and put into production a new formation-type drilling bit for faster drilling in medium formations. Available in sizes 7⅞, 8¾ and 9 in., the new tool was designed for shale, slate, hard anhydrites, and limestone drilling, particularly in the Texas, Oklahoma and Tri-State areas. Design features chiseled teeth with a reinforcing L on the gage reinforced with tungsten carbide. Designated the VH2-G, the bit fills the gap between the VH1 and V2 lines. *Varel Manufacturing Company.*

Combination Bit Developed

226 Desirable features of both the drag and rock bit have been combined in a new bit introduced by Hunt Tool Company for drilling soft and intermediate formations. Tool boasts higher penetration rates, straighter holes, lower torque, less weight, and smoother rolling action. The cones, cutting at and near the periphery of the hole, serve as a pilot, keeping the hole straight to gage and maintaining constant penetration rate. They thus prevent the drag-type blades from penetrating too rapidly and overloading the string with torque. The drag cutters will quickly remove formations at or near the center of the hole, providing fast, uniform penetration. Bit sizes available range from 12 in. to 18¾ in. *Hunt Tool Company.*

Hole Enlargers

227 Two new types of hole openers are being offered at Servco for such operations as gravel packing, cementing, landing casing and liners, and wall scraping. A rock bit type is available for enlarging the hole up to twice



the drilled diameter in soft or hard formations. The blade type is used to open the drilled hole to a larger diameter simultaneously with drilling in soft to medium hard formation.

Full fluid flow passes through jets of standard bits; none is bypassed. Hole can be enlarged to approximately one-fourth greater than drilled size. Blades are dressed with special tungsten carbide material which extends life, assuring a gaged hole. Blade type is available with a 10-in. diam body and 15-in. reaming diam for use in 12-in. hole. Rock bit type is available in various diameters. *Servco.*

Jet Power Junk Retriever Effective in Deep Holes

228 A new jet-power junk retriever developed by Wilson Supply Company reportedly has been used successfully on fishing jobs below 18,000 ft. Simplified tool has small diameter nozzles similar to those on jet rock bits. When ejector pump circulates fluid through these openings, they have a pump effect on surrounding mud. Unit is designed so that the jet pump fluid circulates out the nozzles and back in the open bottom, forcing the junk up through the catch fingers into the tool sleeve. Equipment can be bought outright for export. *Wilson Supply Company.*

New Freepoint Indicator For Deep Drilling Activity

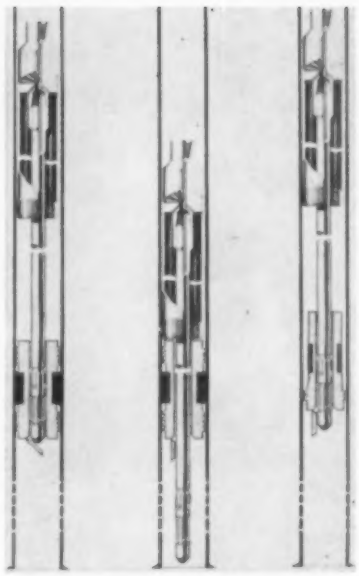
229 Houston Oil Field Material Company has developed a new freepoint indicator to expedite recovery of stuck pipe in deep drilling operations. Called Stresstector, the tool utilizes basic principles of the magnetic instrument and can be run in conjunction with variable frequency oscillator surface indicating equipment now in use. This instrument boasts great sensitivity and resolving power through design and development of a new coil and sensing element and an improved high temperature oscillator, enabling it to detect the freepoint deep in long strings of heavy drill collars.

The subsurface indicator is confined to 1⅜-in. OD and can be readily run through drillpipe or tubing restrictions as small as 1½ in. in diam. It is a full function unit, designed to indicate all forms of stress or strain transmitted down the drillpipe or tubing. The freepoint operator can thus use right or left torque, tension or compression to determine a freepoint in stuck pipe. *Houston Oil Field Material Company, Inc.*

Aluminum-Reinforced Cushion Stabilizer

230 An aluminum-reinforced cushion stabilizer which has proved itself in sharp formations of Wyoming, New Mexico, and West Texas is offered by Grant Oil Tool Company. Durability has been attributed to the exceptionally large aluminum-to-rubber bonding surface. Unique design of the aluminum members provides this extra bonding area and also strengthens the rubber against impact stresses.

Designed to cushion the lateral shock loads and lateral movement of the drill collar or pipe string in the hole, the stabilizer acts as a bearing to the center of the drill string, allowing it to rotate freely on tough, fluid-lubricated rubber. Inner metal sleeve of the boot locks into machined slots in the mandrel if a washover is needed. The boot will not mash down under heavy drill collars in a deviated hole. Worn boots may be changed quickly without removing the entire tool from the string. Stabilizer is made for all hole sizes from 5½ in. to 17½ in. Boots range from 9 to 12 in. in length. The large bore of the tool allows full circulation and free passage of survey instruments. *Grant Oil Tool Company.*



Single Run Packer Retriever Offered

231 Offered by Bowen Itco Inc. is a new retriever designed for engaging, milling over, and pulling drillable-type production packers in a single run. Retriever passes through packer bore in catching position, preventing loss of the packer during milling and pulling the milled-over packer. It will release from the packer downhole and can be reset in catching position, all without coming out of hole. New tool is flexible and versatile in that a particular shoe and bushing will take as many as 4 different stinger-retriever sizes, while a number of the stingers and retrievers will adapt to as many as 7 different shoe-bushing combinations. Standard unit consists of packer retriever, stinger, shoe and bushing. Optional accessories are available. *Bowen Itco Inc.*

Stabilizer and String Reamer

232 Now available with straight or spiral blades in all sizes and lengths is a new combination stabilizer and string reamer featuring low initial cost and replaceable blades. Tool offers more weight on the bit at faster rpm's, straighter holes when spaced at intervals above the bit, controlled deviation when used as fulcrum tool directly above the bit, elimination of sharp bends and keyseats, insurance against "wall sticking," and hollow blades for each washover. Blades are recessed to prevent weld metal from projecting beyond the periphery of the body. If washover operations occur, blades can be easily cut off by an ordinary burning shoe. *Hunt Tool Company.*

Exploration

Quality Built Exploration Trucks

233 For 22 years Griffin Tank and Welding Service has supplied custom fabricated geophysical drilling, fuel and service trucks to the industry. Dependable and versatile, Griffin equipment operates world-wide in oil and gas exploration activities.

The Republic of Sudan, in North Africa, will shortly receive 59 drilling, fuel and service trucks for use in an important rural water development program.

Other Griffin-built equipment operates in Africa, Kuwait, Egypt, Honduras, Australia, Europe and South America.

Several major railroads in the southwest are using motorized section-gang trucks built by Griffin. Public utility, communication, state highway departments and the U. S. Soil Conservation Service employ Griffin-built trucks for specialized operations.

According to James F. Griffin, president, the company is enjoying its biggest year of business and has the largest backlog of orders in the company's history. *Griffin Tank and Welding Service.*

New Rig Effective With Air or Mud

236 Now in production at George E. Failing Company is a new model rotary rig which is equally efficient with air or mud and uses downhole tools or conventional rotary rock bits. It has hydraulically actuated chain pull-down feed mechanism, driven through 4-speed transmission giving wide control range with weight up to 30,000 lb on the bit. Full control over rotary table is afforded through transmission which has 10 forward and 2 reverse speeds. Rig, called Holemaster, may be truck, crawler, trailer or skid mounted. Optional equipment includes three hydraulic leveling jacks, dust collecting system, and a breakout cylinder for downhole tools. *George E. Failing Company.*

Dipmeter Important Source Of Geological Information

237 Gaining new prominence as a source of geological information is the Schlumberger Well Surveying Corporation continuous dipmeter, introduced originally as a guide to sidetracking and placement of offset well locations. Tool is now being utilized to get detailed structural analysis since through its use the entire hole may be logged in a few hours. The expanded interpretation then depends on computation of dips at all points at which correlation can be made on the curves. Patterns of changing degree and direction of dips indicate structural or depositional features. *Schlumberger Well Surveying Corporation.*

Instrument Readings Recorded on Film

234 A special film developed for the oil industry and presently used extensively in exploration around the world is now available in the U. S. The film was used exclusively by the French government in their recent work in the Sahara.

Film can be used on all standard recording instruments instead of paper without special adjustment of instruments. Results have all the advantages of photographic records. Two kinds of film are available: a high-speed orthochromatic film, designed to give the best results under the most difficult conditions of work; and a non-orthochromatic film designed for use in "playback" machines and for reproduction of photographic records made from negatives on paper or film. *Supreme Photo Supply Company, Inc.*

Aeromagnetic Survey Method More Efficient

235 Engineers at Aero Service Corporation have adapted the RADAN Doppler navigation system to drive the magnetic recorder at varying airspeeds to provide airborne magnetometer survey recordings at true ratio to aircraft speeds. Previously, aeromagnetic records were taken with a constant speed unit and aircraft variations were as much as 40 mph between flights, depending on winds encountered. With the latest development, aeromagnetic record tapes will now have a predetermined and constant horizontal scale so that meaningful slope analyses can be done directly on the tape for the first time. Several other record tapes can be placed in series, one above the other, for direct comparison. *Aero Service Corporation.*

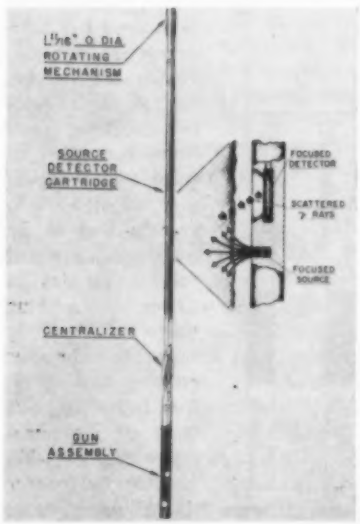
New Carrotless Charges

238 Jet Research Center, Inc. has reported development of additional sizes of carrotless charges. In keeping with the trend to smaller casing, the new charges employ the bonded particle type liner that leaves no carrot and are available for 3⅛-in. and 3⅝-in. OD jet guns, which are usually shot in 4½-in. casing or in similar size liners. The charges, which can be used with any conventional wireline truck, will perform satisfactorily after exposure to 350 F bottomhole temperature for one hour. *Jet Research Center, Inc.*

Oriented Perforations Possible on Single Trip

239 Oriented perforations, necessary in multiple tubingless completions, can be accomplished on a single trip in the well through a new procedure advanced by Schlumberger Well Surveying Corporation. Utilized are a radiation sensing device, a rotation mechanism, and a scallop gun or ribbon jet perforator. The 1 11/16-in. diam of the orienting equipment allows its use in pipe as small as 2⅜-in. OD.

Actuated by an up and down movement of the cable, the mechanical rotating device turns the gun in steps of 30 deg. The sensing device operates on the gamma-gamma principle used in density logging. A gamma ray source and a detector are focused so that rays are both emitted and detected principally in one azimuth. As the tool is rotated past the adjacent casings, their high density affects the detector and marks their positions. Fixed alignment between charges and detector permit perforations to be directed away from adjacent pipe strings. *Schlumberger Well Surveying Corporation.*



Jet Casing Cutters

240 Now being produced by Jet Research Center, Inc. are jet casing cutters for cutting 4½, 5½, and 7-in. casing, and all capable of functioning properly at 300 F. Tools feature instantaneous casing severing at any desired point through use of casing collar locators. The three cutter sizes available are 3⅝, 4⅜ and 5½-in. O.D. for casing. The 3⅝ and 4⅜-in. O.D. will withstand 10,000 psi at 300 F; the 5½-in. O.D. charge will withstand 8000 psi at 300 F. *Jet Research Center, Inc.*

Perforating and Logging Services

241 Star Perforators, Inc., announces the availability of the most modern equipment in the industry for high-pressure and high-temperature perforating and radioactivity well logging in the South Texas area. The company is completely equipped with API standard simultaneous gamma ray/neutron logging tools in both 3⅜ and 1¾-in. sizes, tested for high-pressure and high-temperature work. All other equipment of the company is of this high-pressure variety and includes the latest temperature logging and collar recording equipment. *Star Perforators, Inc.*

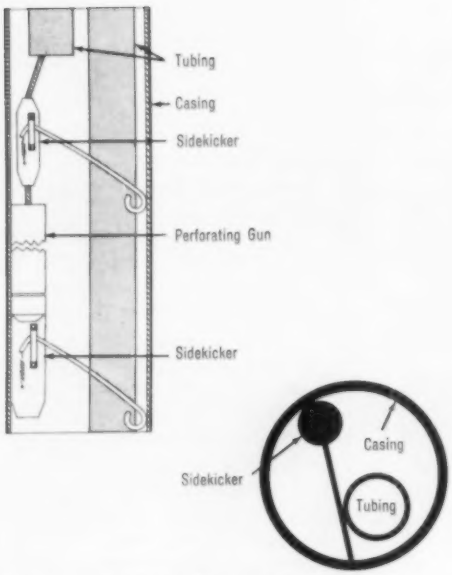
Logging Unit Developed For Economical Servicing

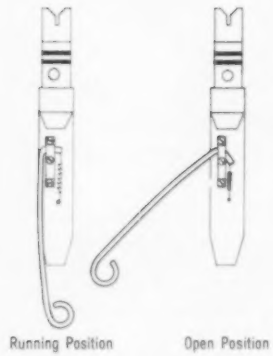
242 Designed to run surveys in all wells up to 20,000 ft in depth without a conventional rig or derrick over the hole is a new production logging unit utilizing 3/16-in., 3-conductor cable. Permanent mounting on a truck of specially designed 32-ft hydraulic mast and lubricator assembly, combined with hydraulic jacks for levelling the truck and supporting the load, allow for more rapid rigging up and elimination of additional costs for portable derricks or rigs. Unit is operated by a 2-man crew. It is engineered for complete well evaluation from a single truck at lower costs. *Birdwell, Division of Seismograph Service Corporation.*

Slimhole Gun Screws Into Steel Carrier

243 Combining desirable characteristics of a retrievable carrier with power of expendable type units, is a new slimhole gun designed by Go Oil Well Services, Inc. for oriented perforating. The 10-gram charge load screws into a steel strap carrier, resulting in a 2⅛-in. OD gun with great perforating power. Charge caps remain in the strap and are retrieved with strap and cable head assembly. Reusable carriers up to 32 ft in length have been oriented and shot in a single run.

Following data is reported following laboratory tests in a standard Berea target based on average of three shots ¼ in. from target: Entrance hole diameter, 0.39 in.; total depth penetration, 7.31 in.; clean depth penetration, 7.07 in.; well flow index, 1.1. Also available is gun of same design, with 1 11/16-in. OD using 6-gram load charge. *Go Oil Well Services, Inc.*





Decentralizer Positions Guns

244 A new mechanical orienting decentralizer has been developed by Welex, Inc. and is called the Sidekicker. The tool was developed for use in permanent type well completions where it is desired to perforate a section of pay in an upper zone without damage to the adjacent tubing string extending downhole to deeper pay zones.

The mechanics of the tool are such that when used with the Sidewinder jet perforating gun, the jet gun cannot perforate the adjacent tubing string. The Sidekicker and jet gun can be run through tubing as small as 2-in. with standard seating nipples. As the Sidekicker and jet gun emerge from the tubing, the Sidekicker pushes the gun against the side of the casing in position to fire. After firing, both Sidekicker and gun carrier are retrievable. All debris is retained inside the carrier and returned to the surface. *Welex, Inc.*

Sound Velocity Logs

245 Sound velocity logs which simultaneously record a 1-ft spaced curb, a 3-ft spaced curve, and either a self-potential or gamma ray curve are being offered by Lane-Wells Company. The tool generates a sharp, high-intensity sound during the logging operation. From passage through the formation, sound is picked up by detectors and carried in the tool.

One-foot spacing gives a considerable amount of detail, permitting direct comparison with other logs, drilling time and core data. Three-foot spacing is used to average values over larger sections and can be correlated with various types of logs. *Lane-Wells Company.*

Well Completions

Slimhole Tubing Head

246 A new slimhole tubing head has been developed by W. C. Norris, Manufacturer, for use in slimhole completions. Designated as the Type SL tubing head, it is available with a 2½-in. EUE, 8-rd female bottom thread. The head will suspend ¾, 1, or 1¼-in. upset or non-upset tubing, or 1½-in. non-upset tubing with either mandrel or slip suspension.

It is rated at 1000 psi test and 500 psi working pressures. A top cap provides a convenient base for a tubing spider. *W. C. Norris, Manufacturer, division of Dover Corp.*

Sliding Side Door

247 A new adaptation of the Type A Otis sliding side-door designed to provide a safer and more economical method of completing high pressure wells has been announced by Otis Engineering Corp. The tool permits blowout preventers to be removed and the tree nippled up prior to circulating the well to displace drilling fluids.

The tool is a modification of the standard Type A Otis sliding side-door which has aluminum pump-out plugs in the ports and a collet-type shifting device made up in the sleeve. It is made up in the tubing with the sleeve in the open position and the plugs in place and run into the well to a position just above the top packer. Plugs in the ports prevent communication between the tubing and the casing annulus and permit the packer to be tested before circulating by pressuring up on the annulus. After testing, the well may be circulated by pumping down the tubing to displace the plugs. When desirable, the sleeve may be closed by pumping an aluminum ball or drop plug down the tubing. The sleeve may be reopened and closed at any time by standard wireline methods. *Otis Engineering Corp.*

Slimhole Bridge Plug With Setting Tool

248 A slimhole bridging plug using a pressure setting assembly with shear stud has been developed by Go Perforator Supply, Inc. A 2 3/16-in. OD setting tool forceful enough to shear a stud requiring pull of 5000 lb permits tool to be run through standard seating nipples in 2⅞-in. casing. Plug uses a cast iron body with slips and rubber packing element. It has held without leaks or movement under test of 6000 psi. *Go Perforator Supply, Inc.*

The fastest acting, most foolproof and flexible method of shutting in the well in an emergency and strangling a blowout is the

HYDRIL

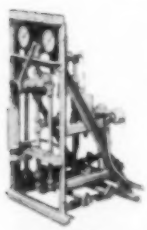
ENGINEERED SAFETY SYSTEM...

No other combination of rig safety equipment so nearly fulfills optimum safety system requirements. Here are the reasons:

HYDRIL BLOWOUT PREVENTERS take over as the ideal substitute for the fluid column should the latter become impaired. Like the fluid column, Hydril Blowout Preventers adapt themselves *automatically* to the shapes of all members of the drill string...will pack off tightly around any of them, yet permit rotation or movement of the string up or down...will even pack off surely and instantly the open hole!

Patented

HYDRIL CONTROL MANIFOLDS are simple and foolproof in operation, requiring little effort and no special tools. Controls are clearly marked for function and easily kept clean and legible. There's a complete range of hydraulically and electrically actuated models, permitting the utmost flexibility in adapting the system to your requirements. Remote Controls are available. Operation of one unit cannot reverse operating sequence of others in the system.



Patented

HYDRIL AUTOMATIC PUMP ACCUMULATORS provide an independent and inexhaustible source of power for operating the system. They store hydraulic power under pressure for instant operation of emergency equipment, and automatically replenish themselves from their own ample reserves of this stored power as fast as it is used.

Patented

HYDRIL "INSIDE" BLOWOUT PREVENTERS secure the inside of the string while the Blowout Preventers shut off the annulus. The Hydril Safety System includes retrievable drill pipe, casing and tubing plugs, drill pipe float valves, downhole safety valves and kelly cocks to assure effective shutoff of runaway well pressures.

Patented

ACCESSORY PROTECTION while rotating, stripping drill pipe or tubing, or running wire line tools, is provided by the complete line of Hydril Tubing and Wire Line Strippers and Rotating Kelly Packers. Designed on the successful and field-proven principles of the "GK" Preventer, these accessory safety devices complete the Hydril Engineered Safety System...the most all-embracing and effective safety system available to the oil industry today.

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HYDRIL TAKES THE "BLOW" OUT OF BLOWOUTS!

Wellhead Features Metal-to-Metal Seal

249 A new high pressure wellhead assembly designed for operation at working pressures to 15,000 psi is manufactured by Rector Well Equipment Company. Meeting all API standards, the assembly is tested to 22,500 psi. The unit features positive metal-to-metal seal throughout. Other features include: a mandrel that is recessed to receive the Rector-PSI full-opening back pressure circulating valve; balance clip suspension with self-activated sealing mechanism allowing casing loads equivalent to joint strength to be hung safely; a new optional auxiliary pack-off with organic packing "floating ring" seal. *Rector Well Equipment Company.*

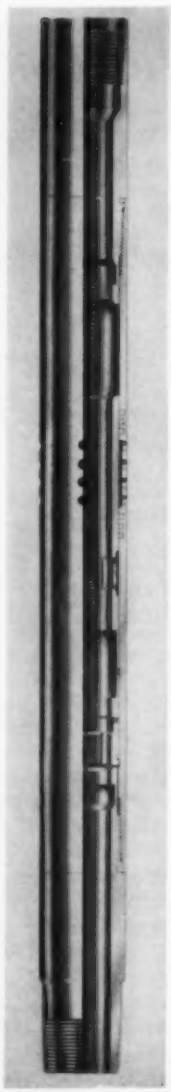
New Cross-Over Eases Dual Producer Problems

250 Development of a new-cross-over tool for use in single string dual producers having a wide zone pressure differential has been announced by Otis Engineering Corporation. Designated the Type A sliding side-door cross-over, the tool eliminates zone feeding problems connected with conventional equipment while chokes are being changed. Tool is full opening, enabling wire-line operations to be performed on the lower zone. It also eliminates the need of a pump truck to equalize pressure across the 2 zones while chokes are being removed.

The cross-over is designed to be made up in the tubing string with a short sub and a Type S landing nipple above it, a tubing sub and ported landing nipple below, and landed in a by-pass or dual packer. A plug choke can be run in and landed in the nipple. The sleeve in the sliding side-door may then be shifted to the open position to permit upper zone flow through a special weldment and into the tubing, while the lower zone is crossed over to the annulus. Flow can be reversed by landing a straight choke in the ported nipple. When changing or removing chokes, the side-door sleeve may be closed to isolate the 2 zones. *Otis Engineering Corporation.*

Full Capacity Circulating Valve

251 A new line of circulating valves with full circulating capacity has been announced by Garrett Oil Tools. The new valves are wireline operated and allow communication to be established or shut off in a tubing string. Using the internal sliding sleeve design with the sleeve traveling in a 1-piece body, the valve features all sealing on one plane, eliminating the possibility of pressure lock or pressure shifting. As a further safety feature, all screwed joints have triple seals with tapered threads that insure positive locking.



Other features of the new circulating valves include: O-ring type seals that cannot entrain foreign material or have lip failures or cup reversals; positive sealing under all well conditions; positive sleeve locating; repeatable shifting force which remains constant with all well conditions and no equalizing position. The valves are available in 1¼, 1½, 2, and 2½-in. sizes and in all popular thread connections. *Garrett Oil Tools, Division of U. S. Industries, Inc.*

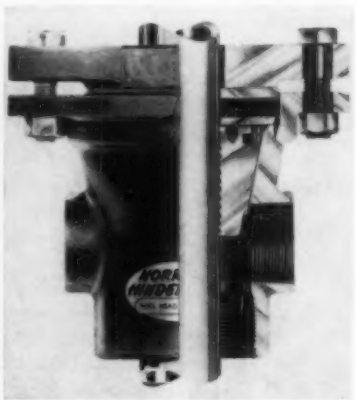
Full-Bore Testing And Completion Tool

252 A new full-bore tool which will perform multiple completion operations with just one trip in the hole is offered by Johnston Testers, Inc. Services include formation testing, multiple shut-in pressures, production tests, squeeze-cementing, acidizing, fracturing, and location of casing leaks. Any number of zones may be tested, treated, and squeezed without pulling tool. A locking system permits the testing valve assembly to hold pressure in either direction. Tubing or pipe may be pressured-up at any time. Test valve is easy to open.

Advantages of the valve system are that initial shut-in pressure can be taken quickly; mud from the annulus cannot contaminate the formation. Unlimited number of bottomhole shut-in pressures can be taken without returning the test section to surface. Packer may be set by simply picking up, torquing to the right and slacking off. When testing valve assembly is out, full opening through tool permits perforating, squeezing and other operations without difficulty. *Johnston Testers, Inc.*

Low-Pressure Tubing Head

253 For use in waterfloods and areas where lower pressures are encountered is a new tubing head that utilizes slip suspension. The Type W S will suspend 5000 ft of 2 or 2½-in. upset tubing. The head may be used with a stripper adapter for servicing by removing the top gland and bolting the adapter to the body flange. Available with either a 4½ or 5½-in. female bottom thread, the Type W S tubing head is rated at 1000 psi test and 500 psi working pressure. *W. C. Norris, Manufacturer, Div. of Dover Corp.*



NEW TWO-IN-ONE TOOL

the **HALLIBURTON** **T a/c**

designed to

ANCHOR TUBING IN TENSION & CATCH TUBING IF IT SHOULD PART

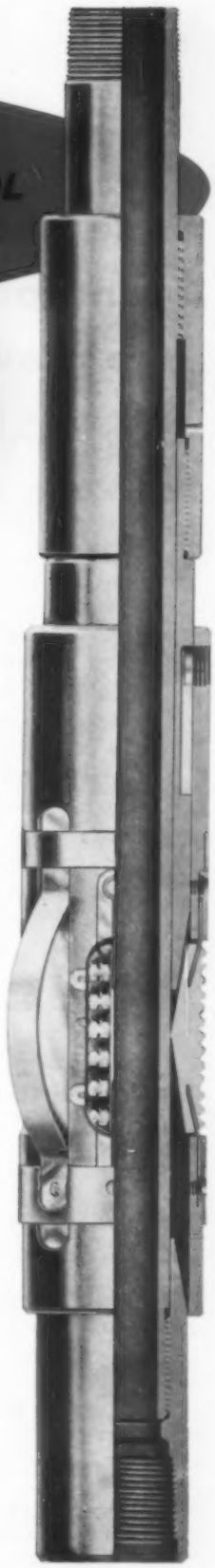
Have you looked into the advantages of setting tubing in tension in your pumping wells? Here are a few . . .

- Increased pump efficiency by reducing restrictions on plunger travel.
- Less breathing and buckling of tubing by reducing tubing stretch.
- Less wear on tubing and rod couplings as well as on threaded connections in the pump.

Performing its *anchor* function, the Halliburton Tubing Anchor/Catcher is set by simple tubing manipulation, and the tubing pulled into tension. Corrosion resistant parts make this sensibly priced tool ideal for most any well.

Once in the well, the *catcher* feature of the new Tubing Anchor/Catcher reduces costly fishing jobs. After the tubing is placed in tension, if a tubing break should occur above the tool, downward movement of the tubing will reverse the position of the slips from lower to upper wedge to prevent further downward movement. Since the tubing movement before the slips are re-engaged is just a few inches, the resulting fish is normally a straight, easily retrieved string . . . not a twisted, jagged stack of steel.

Get the full story on this new two-in-one tool from your Halliburton Representative. Ask for the Tubing Anchor/Catcher Brochure.



OTHER FEATURES TOO!

SETS EASILY – whether *you* pull it up, or a *break* pulls it down!

RELEASES EASILY – from either direction!

EXTRA SAFE – slips may be retracted to neutral position by tubing rotation, if necessary.

275 SERVICE CENTERS . . . JUST MINUTES AWAY FROM YOUR WELL

HALLIBURTON

COMPANY • DUNCAN, OKLAHOMA

See how simple and positive it is to make a BAKER SNAP-SET DUAL COMPLETION

What makes a simple and positive dual-string hookup possible is the fact that a better upper retrievable packer is now available. It is Baker's remarkable new Snap-Set Dual—and it's made in two models, one long-string set, the other short-string set.

Designing a good upper retrievable packer is a big order. A dual packer must hold from above or below—even under extreme conditions of temperature and pressure—and for as many months or years as may be required. It also must release easily when you want to reposition or retrieve.

Other requirements are equally important. Is the packer easy to set and release? Is spacing out simple? Can packers be tested before displacement? Can mud be displaced and zones washed while flanged up? Is there provision for simplicity of workover? For artificial lift?

Do Baker's new snap-set duals satisfy all of these requirements? They do. The important thing is that they do it with clean simplicity of design. Simplicity and reliability go together in a Baker Snap-Set Dual Packer.

BAKER

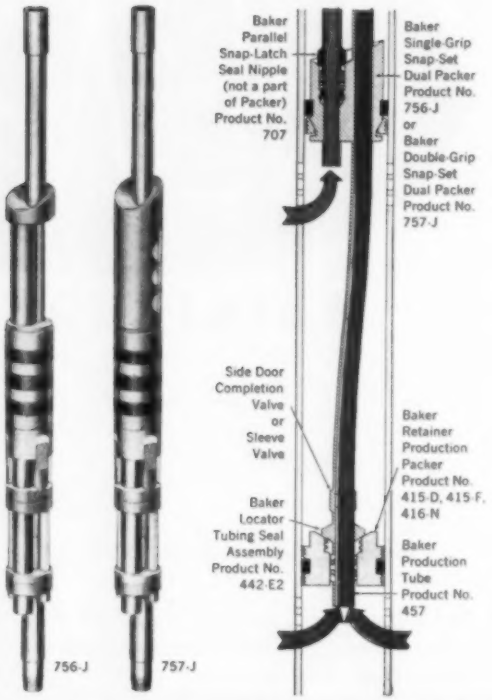
SNAP-SET DUAL PACKERS

48 PAGES OF FACTS

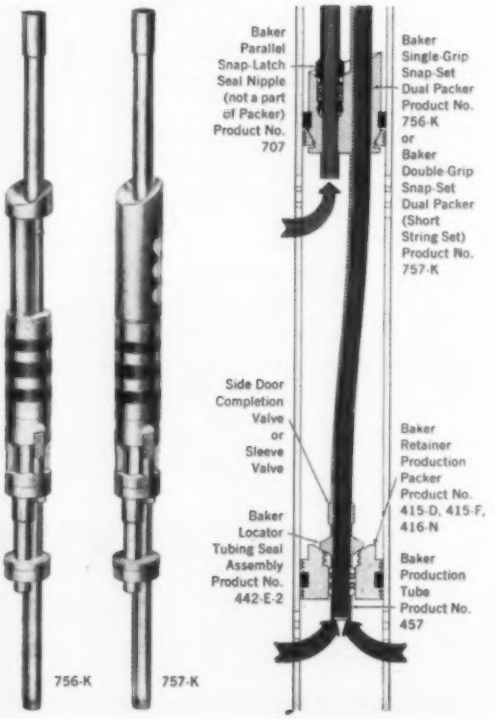
With big pictures and few words, a new brochure tells the interesting engineering story behind Baker's new Snap-Set Dual Packers. Your Baker representative has this story or write to Baker Oil Tools, Inc., P.O. Box 2274, Terminal Annex, Los Angeles 54, California.

BAKER OIL TOOLS, INC.
HOUSTON / LOS ANGELES / NEW YORK

MODEL J IS LONG-STRING SET...


Baker Parallel Snap-Latch Seal Nipple (not a part of Packer) Product No. 707
Baker Single-Grip Snap-Set Dual Packer Product No. 756-J or Baker Double-Grip Snap-Set Dual Packer Product No. 757-J
Side Door Completion Valve or Sleeve Valve
Baker Retainer Production Packer Product No. 415-D, 415-F, 416-N
Baker Locator Tubing Seal Assembly Product No. 442-E2
Baker Production Tube Product No. 457
756-J
757-J

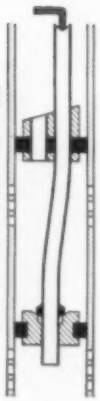
MODEL K IS SHORT-STRING SET...


Baker Parallel Snap-Latch Seal Nipple (not a part of Packer) Product No. 707
Baker Single-Grip Snap-Set Dual Packer Product No. 756-K or Baker Double-Grip Snap-Set Dual Packer (Short String Set) Product No. 757-K
Side Door Completion Valve or Sleeve Valve
Baker Retainer Production Packer Product No. 415-D, 415-F, 416-N
Baker Locator Tubing Seal Assembly Product No. 442-E-2
Baker Production Tube Product No. 457
756-K
757-K

You've set the lower Baker Retainer Production Packer. Now you're ready to set the upper packer, to run the short string, and to bring both zones into production. These seven pictures show how simple it is to do that, using a Baker Model J Snap-Set Dual Packer.

1
RUNNING IN
Made up on long string are Model J upper packer and lower-packer sealing accessories.

2
SETTING UPPER PACKER
When sealing accessories "locate" in lower packer, set-down weight on long string sets and packs off Model J Packer. Repeat setting simplifies spacing out. Now test lower packer if desired.



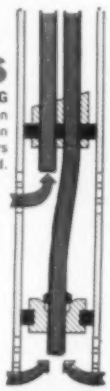
3
RUNNING AND INSTALLING SHORT STRING
Seal on short string "snap latches" into upper packer. Pull back to test for surface indication of seating.

4
TESTING PACKERS
Pack-off tubing at surface; apply pressure as indicated.

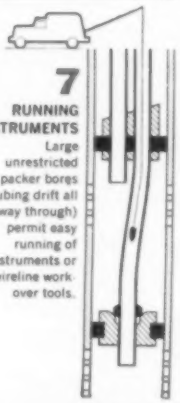
5 a
DISPLACING WITH TUBING PACKED OFF
Pick up and displace both strings. Set back down with set-down weight to pack-off packers and produce.

5 b
DISPLACING FLANGED-UP USING CIRCULATING OR COMPLETION VALVES
If displacing with head on, as in 5a, or flanged-up, as in 5b, isn't required, there are other options.

6
PRODUCING
Now you're on production through packers that really hold.



7
RUNNING INSTRUMENTS
Large unrestricted packer bores (tubing drift all the way through) permit easy running of instruments or wireline work-over tools.



Hold-downs on Double-Grip Versions

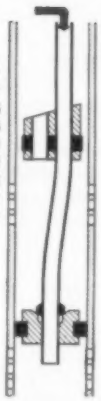
A reminder

Both Model J and Model K are available in single-grip or double-grip versions. Double-grip versions will permit pressuring operations later without having to pull packers.

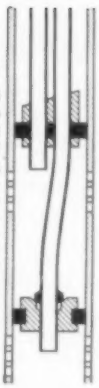
Most Model K hook-ups use the Baker Retainer Production Packer at the bottom, but Model K does permit you to run another retrievable packer at bottom if you want to. It also permits you to keep the long string in natural tension if desired. The pictures demonstrate the simplicity of a Model K dual completion.

1
RUNNING IN
Made up on long string are lower-packer sealing accessories and Model K upper packer.

2
SEALING ACCESSORIES LOCATED IN LOWER PACKER
Now test lower packer if desired.



3
INSTALLING SHORT STRING AND SETTING PACKER
Seal on short string "snap-latches" into sealing bore. Weight set down on short string sets and packs off packer. Repeat setting simplifies spacing out.



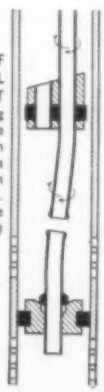
4
TESTING PACKERS
Pack-off tubing at surface; apply pressure as indicated.

5
DISPLACING FLANGED-UP USING CIRCULATING OR COMPLETION VALVES
If displacing flanged-up isn't required, there are other options. Picking up and displacing both strings is a method for Model J only. (See 5a above.)

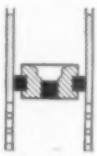
6
PRODUCING
Now you're on production through packers that really hold.

7
RUNNING INSTRUMENTS
Large unrestricted packer bores (tubing drift all the way through) permit easy running of instruments or wireline work-over tools.

USE OF OPTIONAL SAFETY JOINT
Because the long string can be rotated through Model K, a safety joint can be run if desired. (Cannot be done with Model J.)



OPTIONAL EXPENDABLE PLUG
Prior to running upper Model K packer, you can run a Baker Expendable Plug for upper zone work-over. Plug is knocked out when long string enters packer bore.



Casinghead For Tubingless Completion

254 Designed in response to an industry requirement for a casinghead for use in tubingless completions is the Gulfco Type "CYC." It has one standard body that will accommodate the suspending and sealing elements for single, dual, or triple production strings. All mandrels and slips interchange in the standard bowl and all parts are interchangeable in the body. "CYC" casingheads are rated at 4000-lb test pressure and can be furnished with 7⅝-in. or 8⅝-in. male or female thread, or with slip-on bottom for weld. *Gulf Coast Machine & Supply Co.*

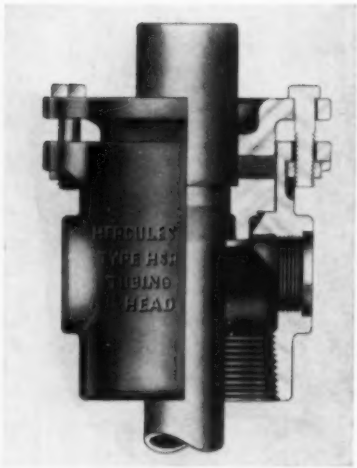
Sliding Sleeve Circulating Valve

255 Camco, Inc. is offering its new Type "C" sliding sleeve to provide a circulating means for use in permanent type well completions, for killing a well, or for spotting acid, fracturing, etc. It is also used for directing flow from the casing to the tubing in either selective or alternate completions. Any number of sleeves may be run in a tubing string and operated selectively with shifting tools in common use in the industry.

Having collar O.D. and essentially full-opening tubing I.D., the sleeve has a tensile strength in excess of that of P-105 tubing in all sizes. Low friction, high pressure dual seals on either side of the circulating ports permit shifting that is virtually unaffected by high temperatures and high pressures. Pressure relief slots provide a means for relieving pressure differentials before completely shifting the sleeve. A stainless steel inner sleeve and stainless steel detents for corrosion resistance plus a minimum area of possible sand fill-up in the closed position provide added assurance of shiftability after being closed for long periods of time. *Camco, Inc.*

Collar-Suspension Tubing Head

256 A new collar-suspension tubing head that can be repacked without disturbing well connections is now being marketed in 3½, 4½, and 5½-in. OD female casing sizes for use on tubingless completions, waterfloods, and shallow pumping wells of 2500-ft depth or less. The 3-in. size body, with 3-in. minimum bore, suspends ¾-in. to 1½-in. plain or EUE tubing. The 4½ and 5½-in. OD bodies have a 4-in. minimum bore and suspend ¾ to 2½-in. plain or EUE tubing. Tubing is suspended with the coupling resting on a ductile iron support ring. The type HSR tubing head is packed off around



the coupling by compressing the neoprene packing ring between the split metal packing and the support ring. Compression is applied by the packing gland that is drawn down by 2 gland bolts. Test pressure is 500 psi and maximum recommended load is 30,000 lb. *Hercules Tool Co.*

Slim Hole Tubing Head

257 Designed and developed primarily for slim hole and tubingless completions where durable, yet economical wellhead equipment is required in the corrosion-resistant, all-weather "SH" slim hole tubing head. The assembly, rated at 4000 psi working pressure, consists of a tubing hanger, wing nut union, "O" ring or steel seal rings, and tubing head with 2 threaded side outlets that are standard 1½ and 2-in. line pipe. The bottom connection is threaded 2 or 2½-in. EUE tubing. When in service, the tubing hanger is secured to the tubing head by the hammer type wing nut union and sealed off with the "O" ring or the optional steel seal ring. *Macco Oil Tool Co.*

Snap-Set Packers Designed For Dual-String Hook-ups

258 Designed to expedite dual-string hook-ups are new retrievable snap-set dual packers which have been introduced by Baker Oil Tools, Inc. Snap-set feature makes it possible to set and unset one of these dual packers any number of times for spacing out, testing, and displacement. To set and pack off, minimum weight is set down. To release, tubing is simply picked up. There is no ball dropping, no rotation, no pressuring, and no cause to come out of the hole for re-cocking.

Three packing elements of balanced hardness are designed to hold pressure from above or below for any length of time even in hot, high-pressure holes. Easy release is possible to reposition or retrieve. Packer bores are largest available to permit running instruments and workover tools. Accessories permit displacement while flanged up. Two models available with or without hydraulic holddown are 756-J, a long-string set, and 756-K, a short-string set. *Baker Oil Tools Inc.*

Medium Service Tubing Head

259 The new Type K tubing head developed by The National Supply Company is intended for use where completion and production methods do not require a more complex assembly. It has a full-opening bore and is available with female casing connections of 5½-in. and smaller. It also can be provided with a 7-in. male casing connection, which has a 5⅛-in. body-through bore. Optional thread or slip suspension for 2⅜-in. or 2⅞-in. OD tubing is obtained with interchangeable mandrel hangers and slip packing units. *The National Supply Company.*

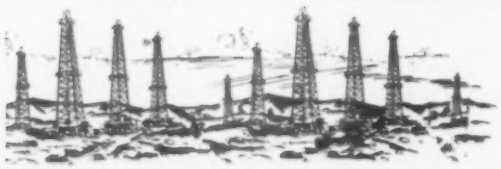
New Anchoring Device Permits Selective Testing

260 A new anchoring device for use in selective drillstem testing available at Johnston Testers, Inc., features ease of operation and mechanical flexibility for economical testing off bottom of the hole. Designated a selective zone anchor, the device eliminates need for anchor or tailpipe on test runs, cutting down time needed to run one or more formation tests. Slip design provides expanded diameter for positive wall contact and is available for holes ranging from 6¾ to 10¾ in. Positive operation is possible through "J" setting and pick-up releasing. It can be rotated out of the hole at any time, saving rig time. *Johnston Testers, Inc.*

For *YOUR* Requirements...

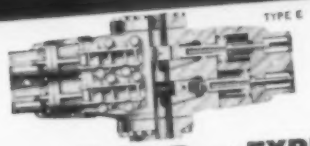
You Are Far Ahead with

SHAFFER PRESSURE PROTECTION



Regardless of the nature of *your* development program—drilling deep wells, drilling "post holes," re-working old wells—you want not only the safest, most efficient pressure protection you can buy, but also equipment scaled to meet *your particular* requirements.

In blowout preventers Shaffer provides the most *complete*—as well as the most *advanced*—line of equipment in the industry. Compare the Preventers shown below, feature by feature, with anything else on the market and you'll readily see why performance-minded operators the world over select SHAFFER equipment!

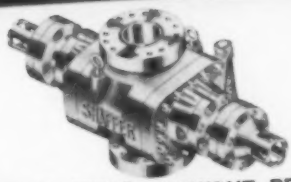


SHAFFER **TYPE B** and **TYPE E** BLOWOUT PREVENTERS

are ideal for the great majority of general drilling applications. Both types feature:

"Swinging Side-Opening" Doors for quick, convenient ram changes without dismantling the hook-up or losing operating fluid... Positive "In-Line" Ram-and-Piston design that eliminates yokes, levers and other complicated assemblies... and many other important advancements!

Type B has *non-rising* locking shafts for those preferring maximum compactness...Type E has *rising* locking shafts for those preferring quick indication of ram position. Otherwise they are the same in their many operating advantages!



SHAFFER **TYPE XHP** BLOWOUT PREVENTERS

are ideal where *extra high* well pressures are a problem. The 7-1/16" bore size safely handles *working* pressures to 15,000 PSI ...the 9" and 11" bore sizes safely handle *working* pressures to 10,000 PSI. All three feature...

"Swinging End-Opening" Doors for quick, easy ram changes without dismantling the hook-up or losing operating fluid... Positive "In-Line" Ram-and-Piston design, with no levers, yokes or other complicated operating connections... and many other Shaffer field-proven advantages!

If you have extremely high well pressures to control, Shaffer Type XHP is the blowout preventer you'll want!

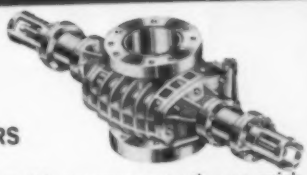
SHAFFER **ROTATING** BLOWOUT PREVENTERS and STRIPPERS

combine a Blowout Preventer and a Stripper in one trouble-free unit that maintains continuous pressure protection *automatically* as long as the drill string is in the hole.

There's nothing to forget—or remember—with this unit because it is always packed off around the drill string, whether the string is rotating, is being raised or lowered, or is stationary. Moreover, the self-adjusting Stripper Rubber expands and contracts automatically to fit the varying diameters of drill pipe, couplings and tool joints—as well as the varying shapes of square, hexagon and octagon kellys!

You can use this unit for regular drilling; for drilling with air or gas; for drilling with reverse circulation; and for drilling under pressure...wide-range versatility to fit *your* drilling requirements!

SHAFFER **TYPE LWS** BLOWOUT PREVENTERS



are particularly designed to simplify pressure protection on quick in-and-out production and re-work jobs where light weight and minimum rig-up time are vital factors.

In the 7-1/16" Bore Size, Type LWS Preventers weigh only 780 lbs. for easy transportation and handling... Operation can be either by a conventional hydraulic system or by a portable hand-pump where simplest possible installation is desired.

These features, plus all the other Shaffer advancements (Swinging *End*-Opening Doors, Positive "In-Line" Ram-and-Piston design, etc.) make the Type LWS ideal for modern repair and re-work jobs!

REMEMBER—Shaffer's line of pressure control equipment also includes a complete range of *Mechanically*-Operated Blowout Preventers...plus Shaffer Landing, Casing and Tubing Heads...Shaffer Flow Beans...Shaffer Kelly Cocks...Shaffer Plug Valves ...and other advanced pressure control units.

Also, the Shaffer "Two-In-One" Down-Hole Tools (Shaffer-Waggener Bumper Safety Joints and Shaffer Jar Safety Joints) are simplifying drilling and fishing jobs wherever difficult operations are a problem!

WRITE FOR HELPFUL LITERATURE that describes the above products in greater detail!

37 years OF OIL TOOL LEADERSHIP

SHAFFER

HIGH PRESSURE DRILLING AND CONTROL EQUIPMENT - FISHING TOOLS THAT EXCEL

CALIFORNIA SERVICE SHOPS: Santa Fe Springs, Santa Maria, Ventura, Avenal, Bakersfield and Taft
HOUSTON, TEXAS, 6006 Navigation Blvd. • ODESSA, TEXAS, 1925 West Second Street
OKLAHOMA CITY, OKLAHOMA, Shaffer Tool Works, 6201 South Shields Boulevard
FARMINGTON, NEW MEXICO, Shaffer Tool Works, Post Office Box 546
CASPER, WYOMING, Shaffer Tool Works, Post Office Box 1788
HOUMA, LOUISIANA, Shaffer Tool Works, Post Office Box 827
EXPORT SALES OFFICE: Shaffer Tool Works, 500 Fifth Avenue, New York, N.Y., U.S.A.
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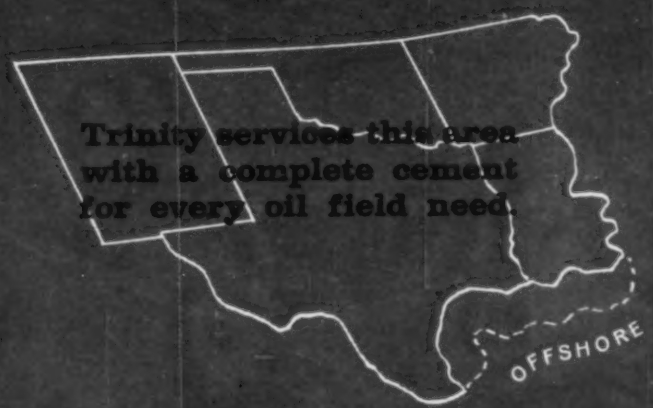
NOW, A TRUE

Trinity Lite-Wate Cement



LIGHTWEIGHT CEMENT

FOR OIL WELLS

376 LB. BARREL (94 LB. SACK)

COMPLETE . . . JUST ADD WATER!

Complete as produced at our plant – always the same – this new cement gives you a remarkably uniform, *low density* slurry through the entire job. Because it maintains its desirable qualities through an exceptional range of water-cement ratios, slurry density is controlled by the quantity of water.

PROVED IN THE FIELD

Today there are over 200 completed Trinity Lite-Wate jobs – from the grass roots to 8,000′ – *every job a success*. Returns were achieved in every case where attempted.

SULPHATE RESISTING . . . LOW PERMEABILITY

Sulphate resistance, permeability, strength, and settling tests exceed oil company requirements when tested under API standards.

GET COMPLETE LABORATORY DATA NOW!

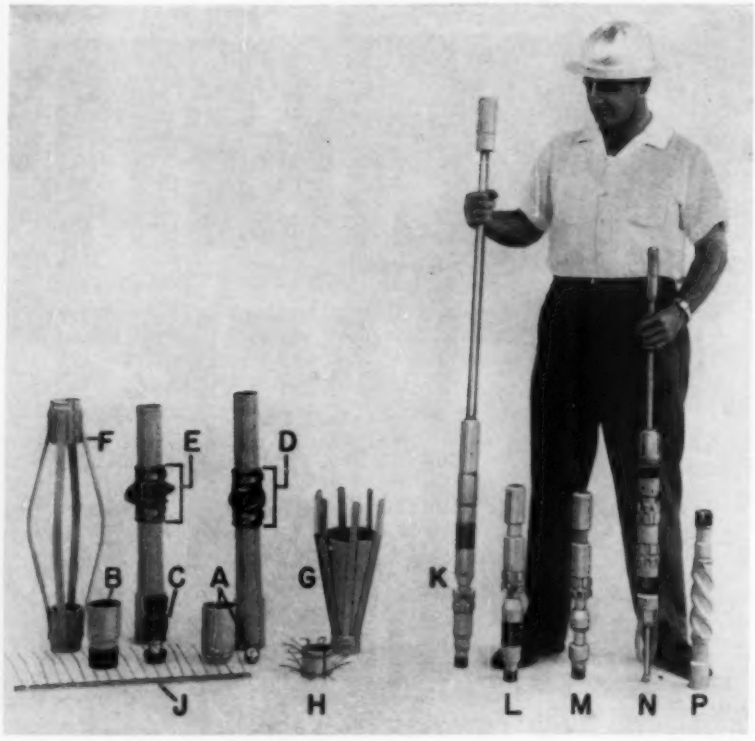
Trinity Lite-Wate is the result of exhaustive research efforts. It is the newest member of our already highly regarded oil well cements. Complete laboratory data are available now.

CALL YOUR LOCAL TRINITY REPRESENTATIVE OR WRITE OUR DALLAS OFFICE P. O. BOX 2698, OR PHONE RIVERSIDE 2-8111

TRINITY

PORTLAND CEMENT DIVISION
GENERAL PORTLAND CEMENT COMPANY

DALLAS FT. WORTH HOUSTON



New Line of Tubingless Completion Equipment

261 Baker Oil Tools, Inc. is offering a wide line of tubingless completion equipment for all phases of oil well completion, production, and workover.

For primary cementing, the Baker full-flow tubing guide shoe (A) can be made full-opening by pumping a ball to the shoe and applying pressure to shear the guide out of the shoe. The shoe is usually run with the full-flow tubing fill-up collar (B) with cementing plug, which contains a drillable baffle plate that acts as a plug seat for the cementing and back-pressure plug (C). The Turbulizer (D) reduces channeling when cementing multiple tubingless completions by spacing the tubing strings apart so that cement will flow evenly around each tubing string (a larger OD version (E) for use on single strings is available).

The tubing centralizer (F) centers the tubing to provide a uniform cementing space. The metal petal basket (G) serves as a bridge during cementing jobs to protect lower formations. The wall scratcher (H), available with either 2½ or 4½-in. long wires, provides maximum removal of mud cake from the wall of the hole in the area to be cemented, with minimum removal of mud while running in. A rotating-type wall scratcher (J) is also available.

For completion and production, the retrievable casing packer (K), a set-down packer with an integral long-stroke circulation joint, is available in both single-grip and double-grip versions as a squeeze tool or production packer. The full-bore invertible packer (L), run either as a set-down or tension packer, is designed primarily for waterflooding but can also be used for other pressuring operations. The tubing tension anchor (M) eliminates breathing and buckling by securely anchoring a pumping string after it has been placed in tension. The retrievable tubing bridge plug (N) is a dependable, leakproof, yet retrievable plug that can hold pressure from either above or below. It may be used either alone or as a straddle tool in conjunction with the retrievable casing packer. The tubing scraper (P) has a new design to provide more cutting edge and more coverage, and the spiral design provides a track through which the cuttings and scrapings may be washed up.

This new line is being expanded with the addition of more tubingless completion equipment. *Baker Oil Tools, Inc.*

Tension Tubing Anchor Meets Efficiency Tests

262 Successful efficiency tests are reported for a compensating frictional tubing anchor offered by McGaffey-Taylor Corporation. Tool counterbalances tubing movement or "breathing" caused by fluid weight variations on the standing valve during pump reciprocation and automatically compensates for expansion or contraction of the tubing itself with changes in temperature or buoyancy. Tubing-to-piston area ratio arrived at provides only sufficient holding power to give positive gripping action in keeping the tubing in its natural tension during its pumpng cycle; however, the anchor's smooth contact members will allow the tubing to return to its natural tension when temperature changes occur. *McGaffey-Taylor Corporation.*

Pre-formed Sand Screen

263 A sand control screen that uses a sand face as the direct screening medium, without an outer covering of metal, is available from Halliburton Oil Well Cementing Company. The preformed screen is essentially an outer cylinder of sand, bonded together and held in place by thermo-set resin, around standard perforated or slotted tubing. Because of the screen's greater exposed surface flow area — several times as much as conventional liners — screening of formation sand is diffused over the screen's entire surface, rather than at restricted points of entry.

The consolidated sand mixture in the screens has a compressive strength in excess of 3000 psi. Permeability of the consolidated sand is 23 darcies and porosity is 26 percent. The screens are presently available in 6-ft lengths and 2 sizes: 3.9-in. OD and 5.75-in. OD. *Halliburton Oil Well Cementing Company.*

Wellhead Completion Equipment Efficient

264 Multiple completion wellhead equipment featuring simplicity, flexibility, economy and durability are emphasized at Oil Center Tool Company. Feature of the current tree range is that one valve can be removed without disturbing the others, enabling operators to correct problems in one producing zone without disrupting flow in others. Specially-adapted flow units are installed on all multiple completion units. For single completions, low pressure tubing head combines same desirable characteristics, enabling operator to use tubing stripper in combination with other equipment without necessity for adding stripper housing or bowl. *Oil Center Tool Company.*

See why ALCOA ALUMINUM makes a good design habit

Requirement: strength without unnecessary weight plus superior corrosion resistance for world's first aluminum fly-in rig

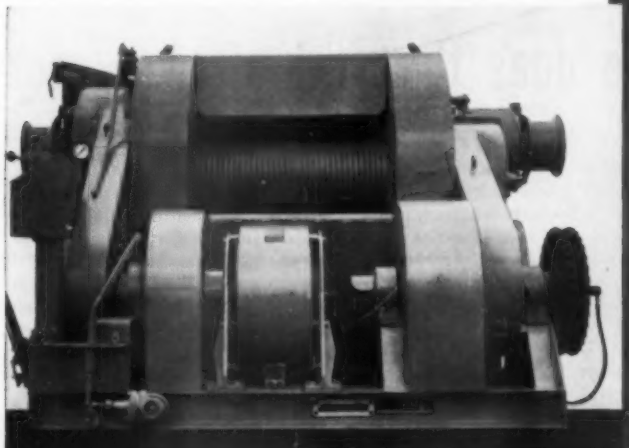
Key to good design: aluminum magnesium alloy 5456 developed by Alcoa

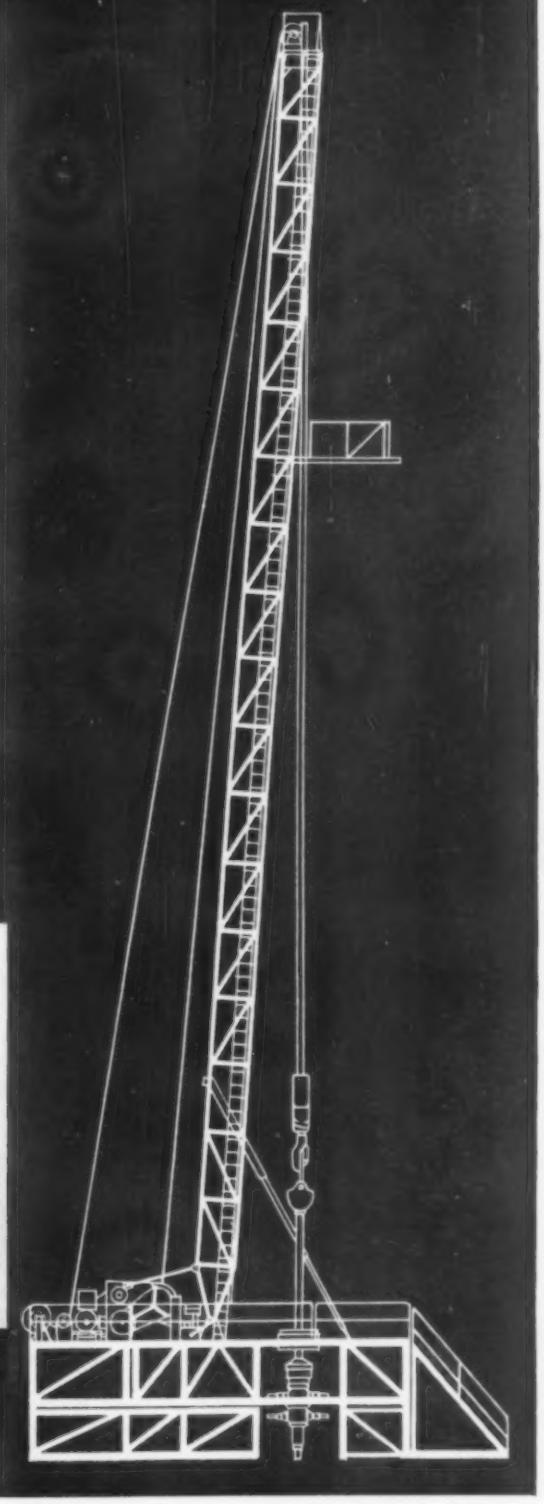
With tests in actual drilling muds, ALCOA engineers proved the superior corrosion resistance of aluminum magnesium alloy 5456 for use in the world's first aluminum fly-in drilling rig. And the excellent strength-weight ratio of this ALCOA®-developed alloy made it perfect for use in the subbase of a special Wagner Morehouse, Inc. draw works that forms the heart of the new rig.

The new rig makes extensive use of the light, strong, corrosion-resistant ALCOA-developed alloy throughout. The substructure is fabricated of aluminum structural members. A fabric mud tank employs an aluminum support frame. The suction tank and suction manifolding in the mud system are aluminum. And aluminum is used for a special shale shaker support and desanding ditch.

The new rig breaks down into 4,000-lb packages for easy helicopter transport. It will be used in hard-to-reach Central Bolivia—in a joint exploration program for Bolivia California Petroleum Co., a subsidiary of the Standard Oil Co. of California, and Compania Petrolera Boliviana Shell, Ltd., one of the Royal Dutch Shell group of companies. Loffland Brothers de Caracas C.A. is the drilling contractor.

Here you see how ALCOA engineers apply over 40 years of petroleum experience to make aluminum the good design habit for the petroleum industry. ALCOA knows aluminum and knows oil and knows how you can put the two together for more profitable operation. Our file of process industries literature will suggest many ways aluminum can serve you. To get it, write ALUMINUM COMPANY OF AMERICA, 881-G Alcoa Building, Pittsburgh 19, Pa. World-wide sales through ALCOA INTERNATIONAL, INC., 230 Park Avenue, New York 17, N.Y.

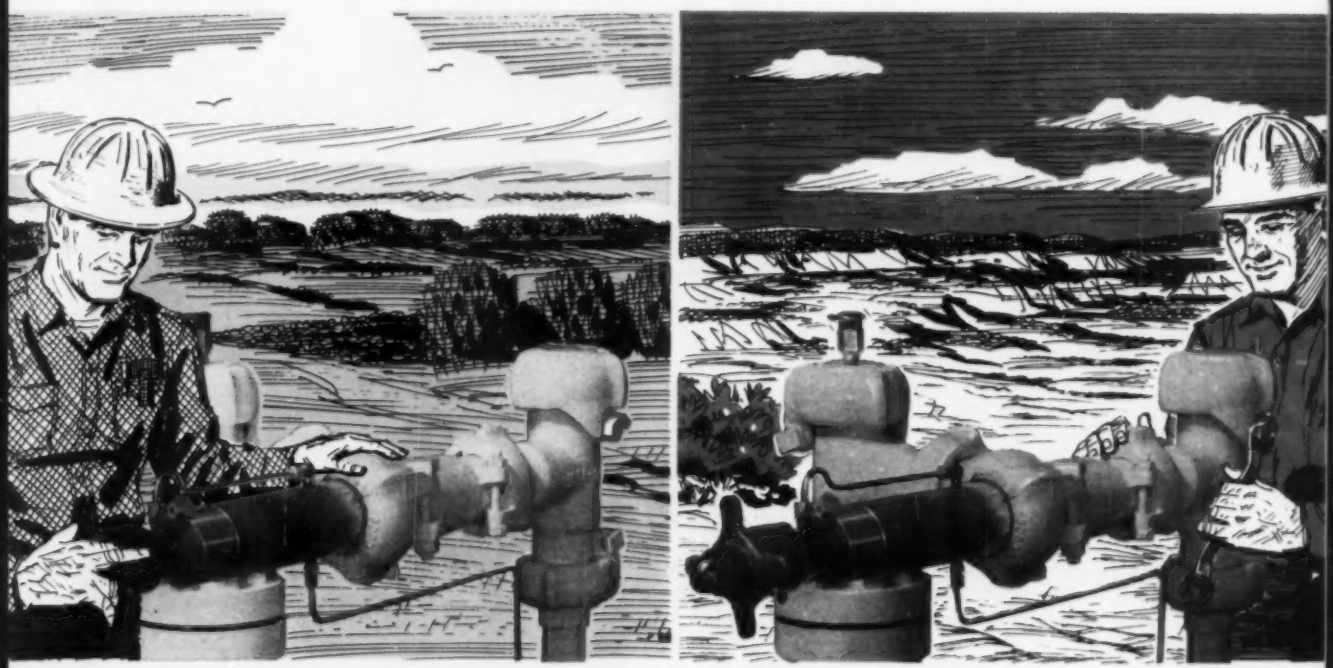




ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

ONLY THE NEW UNIBOLT

IS BOTH A WING VALVE AND



As a wing valve, it opens and closes manually for choke changing.

Here's how this one valve does the work of two... for littl

Stated simply, the new UNIBOLT Pressurematic Valve is an adaptation of the tried and proven UNIBOLT Adjustable Wing Valve with an added automatic closing feature. (Any of the thousands of Adjustable Wing Valves now in Christmas tree and other services may be readily converted to "Pressurematics" by replacing the standard stem/bonnet assembly with the new automatic assembly).

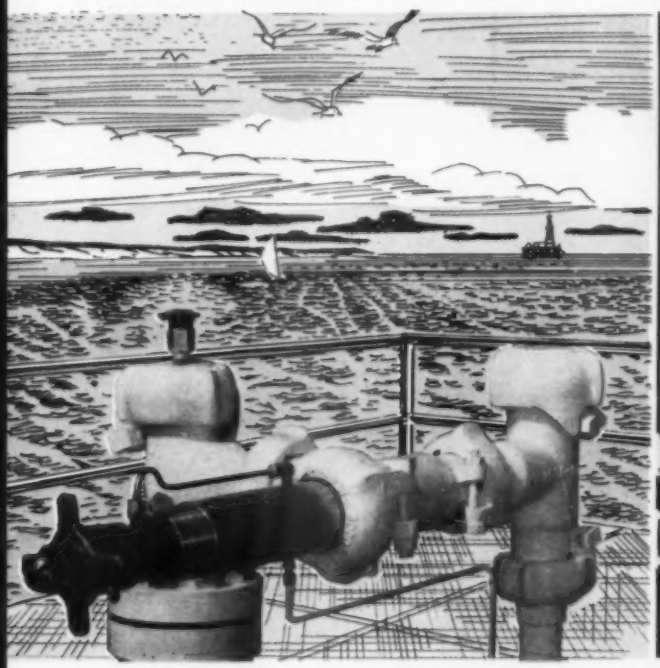
Heretofore, in order to protect a well against broken flow-lines and similar mechanical failures that would permit the well to flow wild, an automatic "high-low" valve has been installed in the manifold beyond the wing valve. Now, a single Pressurematic Valve not only safeguards the well against these hazards but also serves as a fine, easy-operable wing valve.

NO SPRINGS — The Pressurematic design is preferred by many operators because it employs no springs in its actuating mechanism. The design is simple and trouble-free. An ages-old engineering principle, that of balancing a large diameter piston under low pressure against a small diameter piston under high pressure, has been incorporated in the design of the Pressurematic Valve. In this case, high well head pressure acts against a small diameter piston which is balanced against the relatively low flow-line pressure acting against a larger diameter piston.

PRESSURE SURGE OR DROP CLOSES VALVE — Once the well head and flow-line pressures are established, it is an easy matter to select the proper sizes of pistons required for balancing. Then, when pressures rise or fall beyond predetermined limits, the valve closes instantly, automatically. For example, a broken flow-line would cause the flow-line pressure to drop sharply and the Pressurematic Valve would close instantly, automatically.

PRESSUREMATIC VALVE

A HIGH-LOW SAFETY VALVE



Set for automatic operation, it provides 'round the clock protection.

PATENTED AND PATENTS PENDING

more than the price of one:

CLOSES EASILY BY HAND FOR CHOKE CHANGING — Unlike all other "high-low" safety valves, the Pressurematic Valve is an excellent Christmas tree wing valve. A few turns of the handwheel closes it for choke changing. Then, the valve is opened and set for automatic operation by further manipulation of the handwheel. Like the UNIBOLT Adjustable Wing Valve, the seat in the Pressurematic Valve is large enough to pass practically any desired quantity of oil or gas. And, the entire automatic assembly is corrosion-resistant stainless steel. Stems and seats of special analysis steel, specially heat-treated, are also available.

IT SAVES YOU MONEY — This combination automatic shut-off and wing valve costs little more than the price of a good wing valve or a conventional "high-low" valve alone.

Descriptive literature will gladly be sent on request.

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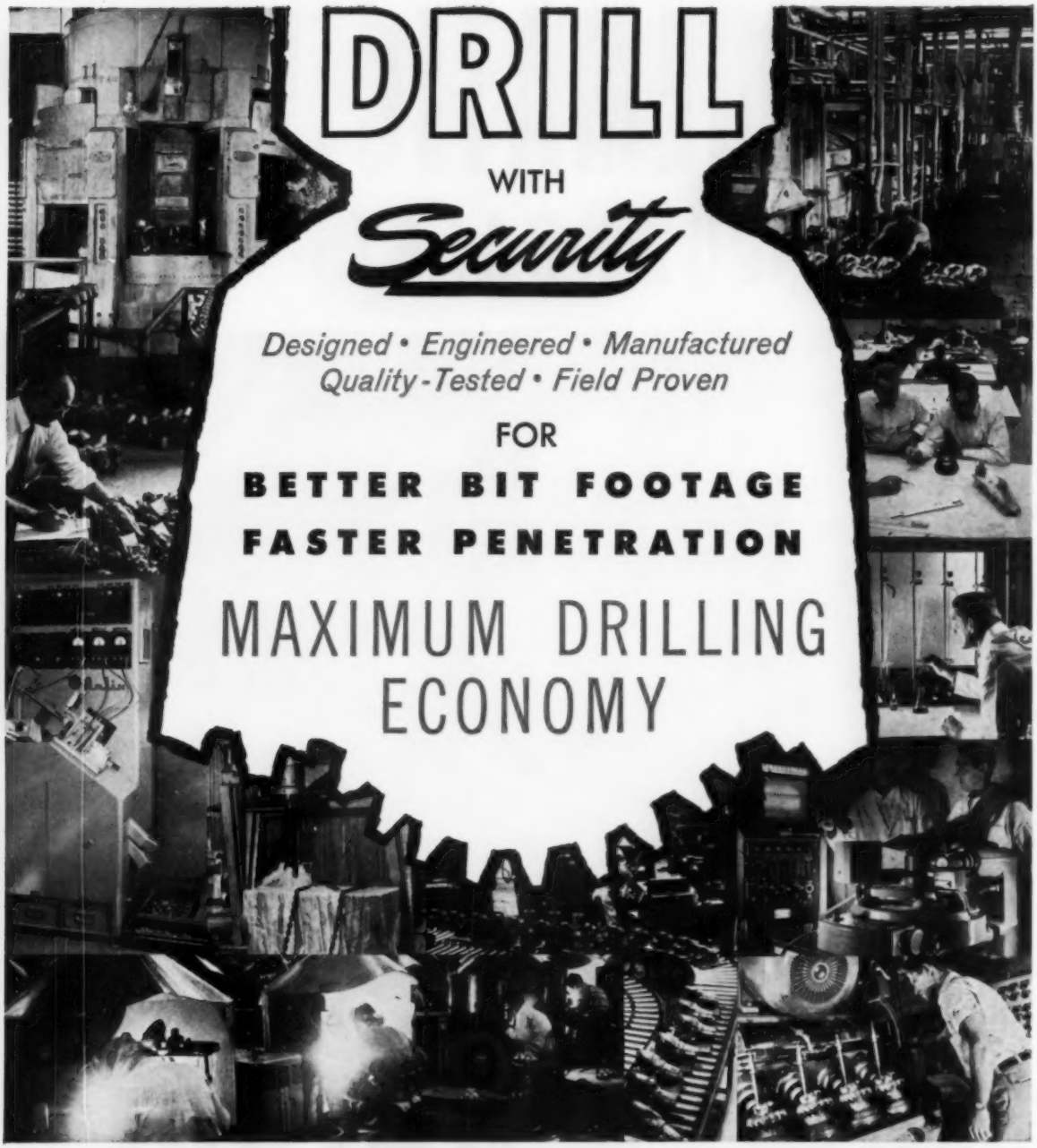
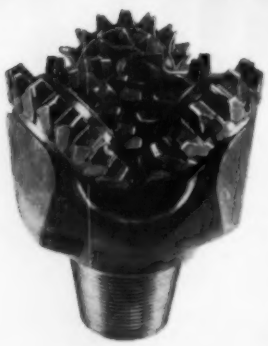
MAXIMUM DRILLING ECONOMY





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Underneath Venezuela

"U" Sand, Aguasay Field, Eastern Venezuela: producing depth, 14,027 feet; productive thickness, 180 feet; permeability, less than 0.1 to 250 millidarcys; porosity, 6 to 20%; residual oil, 34.5%; total water, 17.4%.

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The T-I-W Type LP Liner Setting Assembly is recommended for setting long liners, where wiping the strings clean of cement is desired.

The assembly, shown at right, consists of a Type LS Set Shoe (with or without back pressure valves), a Landing Collar which provides a seat for the Wiper Plug, a Liner Hanger (when it is desired to suspend the liner), a Type L Packer with or without Hold-Down Slips (a Liner Setting Collar can be furnished when packer is not desired), a Liner Wiper Plug pinned to the Inverted Swab Assembly, a Type L Setting Tool with setting string connection, a cementing Manifold with setting string connection to retain the Pump Down Plug, and a Pump Down Plug to wipe the setting string.

CALL, WRITE or WIRE TODAY for complete details on dependable T-I-W Liner Setting Equipment and experienced field supervisory service.

The Hanger With Most Positive Performance

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Oil and gas horizons are graphically identified by simple comparisons of Sonic and Resistivity data. These fast methods of interpretation are appropriate for well-site application. Potentially productive zones thus found can be further investigated by quantitative methods—or can be checked by sidewall cores and formation tests.

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THE EYES OF THE OIL INDUSTRY

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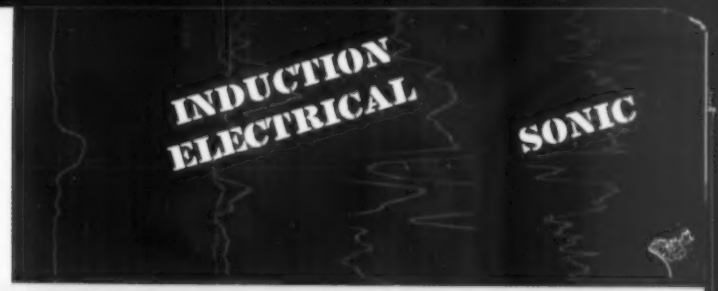

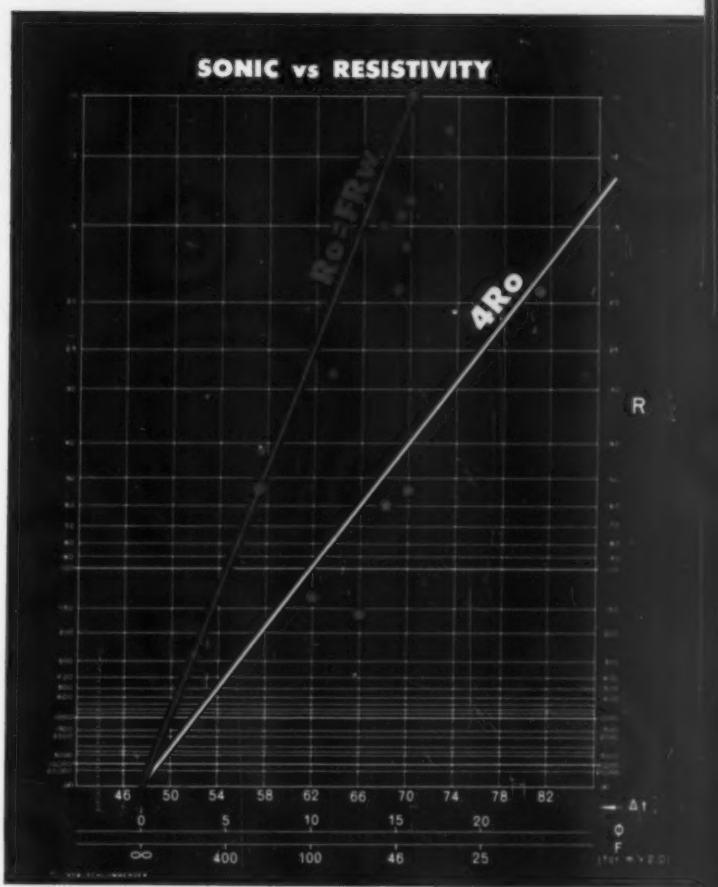

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NEW CAST IRON SLIM HOLE BRIDGE PLUG

Development of a new wire-line setting tool now makes possible a cast-iron bridge plug for 2½" casing. The setting tool uses a power charge that shears a pin requiring more than a 15,000 pound pull.

Similar in principle to drillable cast iron plugs for larger casing, this is the first bridge plug of its type for slim-hole completions. It utilizes a rubber packing element of Hycar that resists extremely severe well conditions and assures positive seal without danger of rupturing the pipe. The plug and setting tool diameter of 2⅜" allows it to pass freely through seating nipples.

Because setting tools are sold outright to wire line service companies, minimum rental requirements are eliminated. This — plus low cost of the plug — greatly reduces plug-back costs.

• **For detailed information about this new slim hole bridge plug, write**

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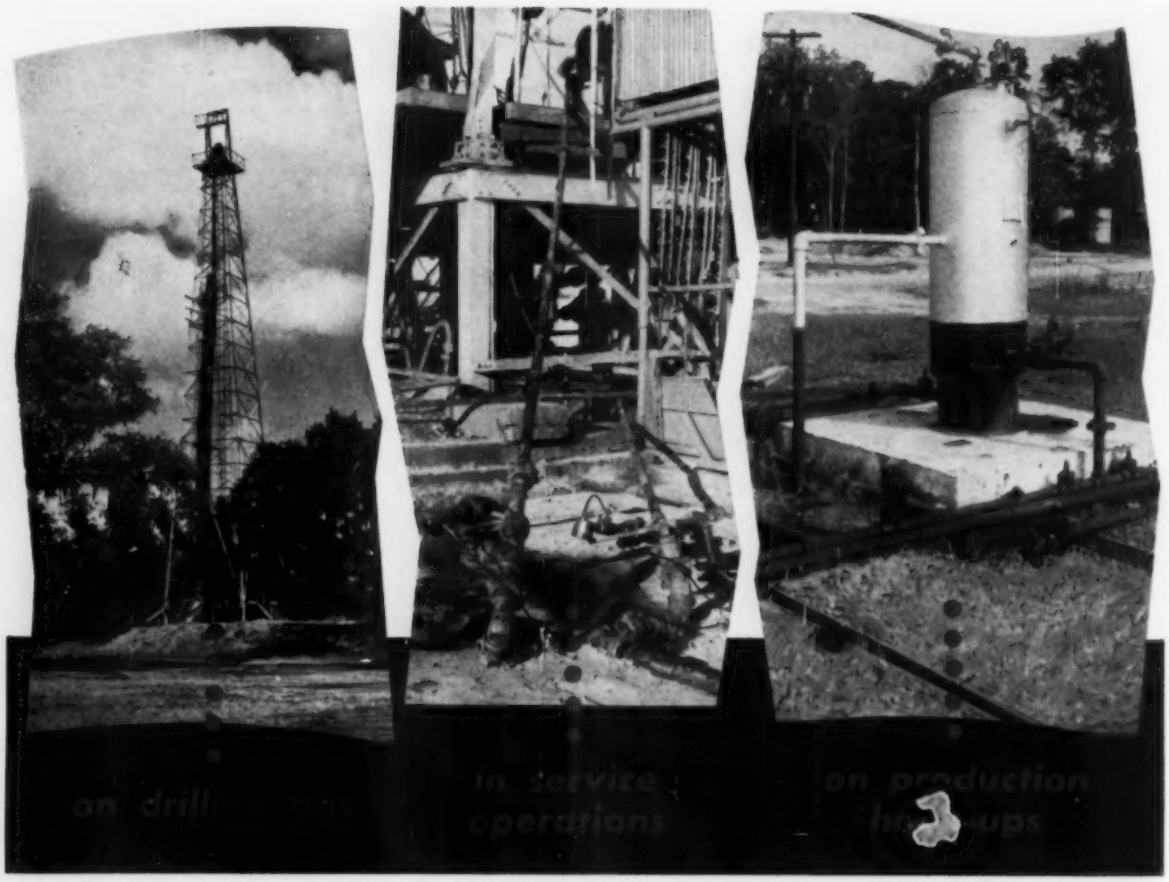
Casing Jets	Fracturing Jets	Aluminum bridge plugs	Cable heads
Thru-tubing Jets	Bullet guns and supplies	Dump bailers	Wire line trucks
Slim-hole Jets	Thru-tubing bridge plugs	Casing collar locators	Radio-active logging equipment



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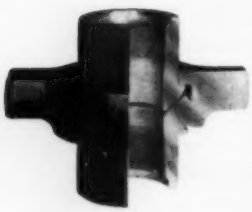

Quality keynotes the design, engineering and manufacturing of WECO unions to give you better unions wherever they are needed in oil field operations. On the drilling rig, WECO unions mean faster rigging-up with greater assurance of dependable leak-proof piping. In service operations you rig-up fast and know that with WECO unions on the job you can handle the high pressures, high volumes and heavy abrasives of cementing, acidizing and sand fracturing without danger of leaks. When setting tanks, treaters, separators, installing field headers, manifolds and other production piping, WECO unions save time, and trouble.

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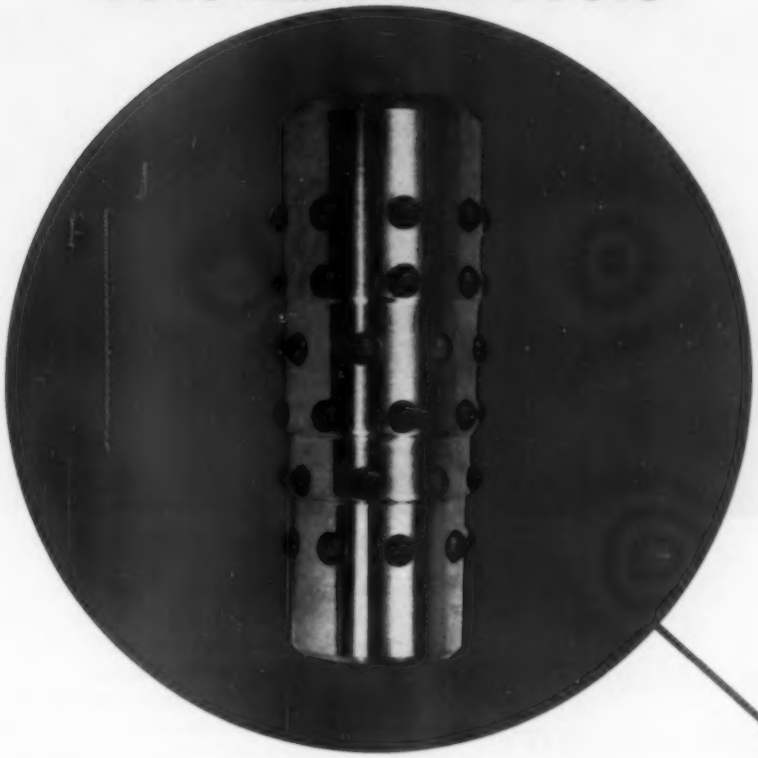

Reamer costs in hard formation areas are being reduced as much as 70% by Drilco's NEW and EXCLUSIVE Mark VI Knobby Reamer Cutter —the only reamer cutter using Tungsten Carbide compacts.

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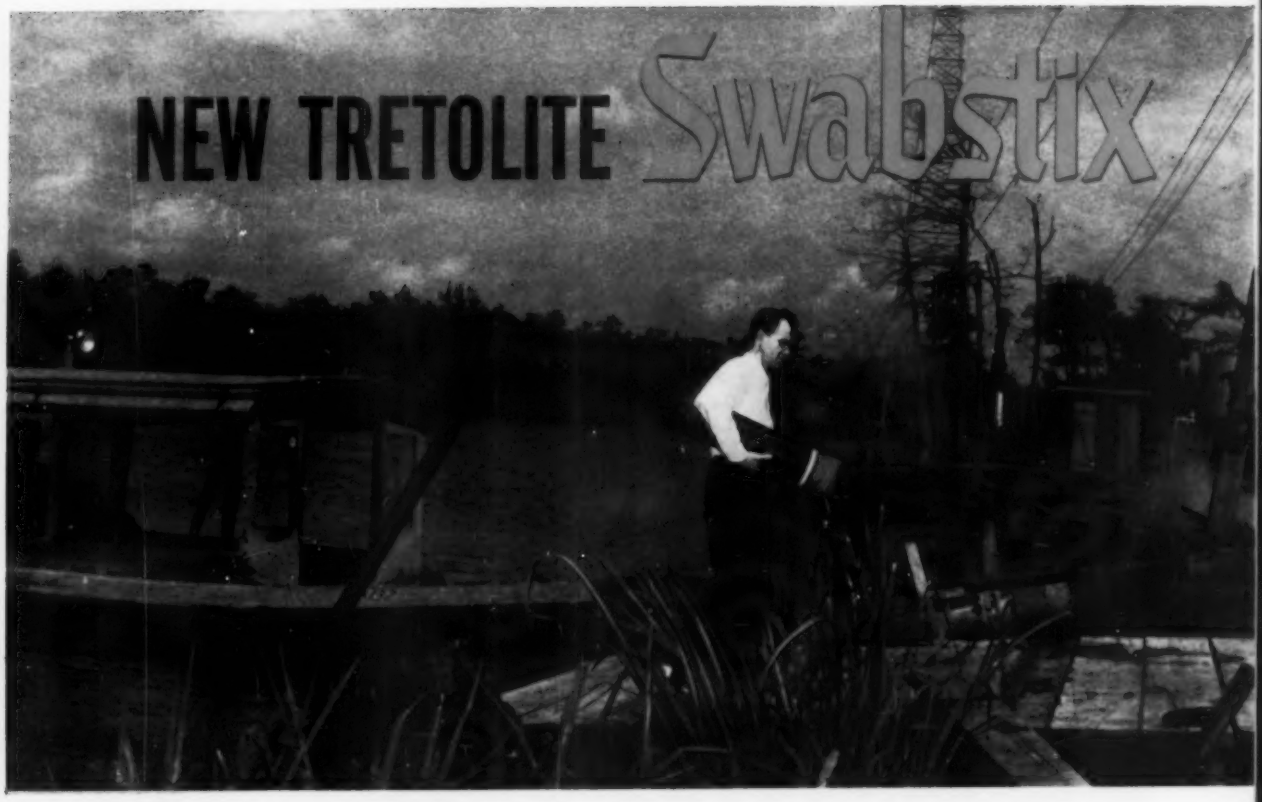
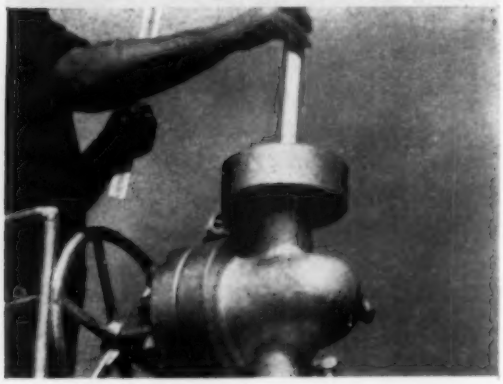


a complete well swabbing "rig" you can carry under your arm!



Swabbing is accomplished by dropping SWABSTIX Flow Inducers down the well tubing.

SWABSTIX* Flow Inducer, the newest and one of the most revolutionary products ever developed through Tretolite research, now makes it possible for oil wells to be swabbed through *chemical* action.

This remarkable achievement has far-reaching significance for the petroleum producing industry. It means that fluid-logged wells that have temporarily lost flow can be brought into production without waiting for mechanical swabbing equipment to become available, for bad roads to become accessible, for swabbing rigs to be transported to hard-to-reach offshore or bayou locations. New wells which may require swabbing to induce flow can also be activated by SWABSTIX applications.

SWABSTIX Flow Inducer treatment is a one-man operation requiring no equipment other than a wrench to gain access to the well tubing. To swab the well, sticks of SWABSTIX Flow Inducer (each 1¼" in diameter and 24" long, packaged six to a carton) are simply dropped down the tubing—certainly the most convenient swabbing method ever devised. Oil flow is started quickly and easily.

*Registered trademark, Petrolite Corporation

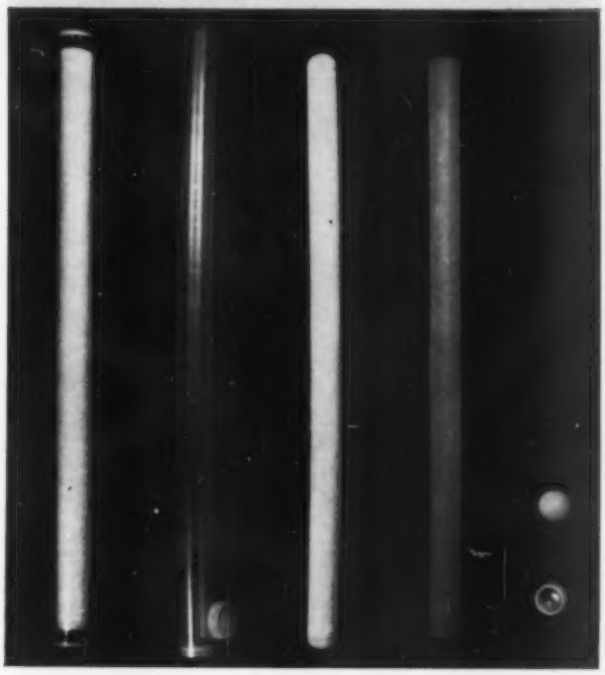
FLOW INDUCER

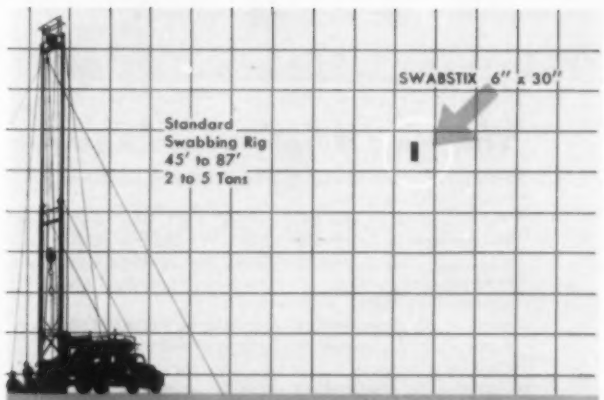
restore oil flow the new chemical way

Each SWABSTIX Flow Inducer unit consists of a water-soluble, oil-insoluble plastic cylinder filled with a powdered chemical. Because the cylinder is oil-insoluble, it remains intact while traveling through the oil phase in the fluid-logged well tubing. Upon reaching the water stage, the cylinder dissolves and the released chemical rapidly generates gas by reaction with water. This gas increases in volume as it rises toward the surface, displacing fluids which are discharged at the well head.

SWABSTIX Flow Inducers do not work miracles—they cannot cause a well to flow if it is incapable of flowing. Properly used, however, they provide a more convenient and faster swabbing application than is possible with conventional mechanical methods.

SWABSTIX Flow Inducer components are (from left): unit package, outer polypropylene tube and caps, chemical unit, water-soluble tube and end caps.





Graph shows comparative size and portability of conventional mechanical swabbing rig and SWABSTIX carton.

Ask the Man in the Red Car to explain more about the use of this new Tretolite product, or write for SWABSTIX brochure just published.

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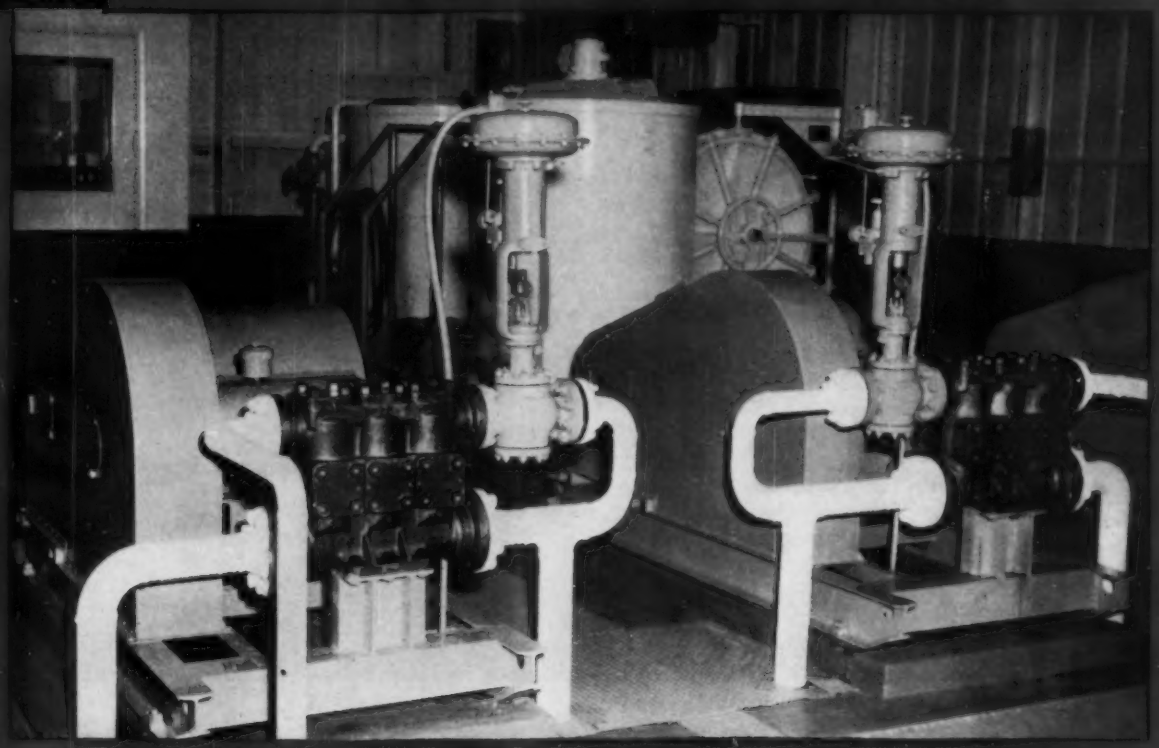
GASO PUMPS

WHAT'S BACK OF GASO LEADERSHIP IN WATER FLOODING?



There's a Single-Word Answer: PERFORMANCE

The photograph shows one of a steadily mounting number of Gaso installations in water flooding service.

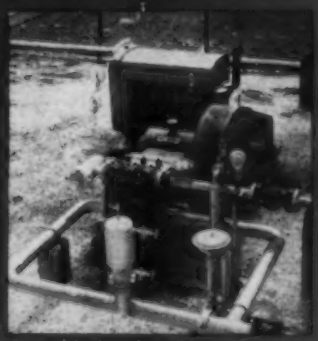
The injection pumps (3) are Fig. 3365, 1¾" x 3" Gaso Horizontal Triplex Plunger Pumps, driven by 40 HP 1200 RPM electric motors.

The fluid ends are of aluminum bronze fitted with ceramic plungers, non-adjustable type plunger packing (in both power and fluid ends) and Bakelite insert type valves mounted on Monel valve seats.

Each of the three pumps, operating at 350 RPM, delivers approximately 1075 barrels a day at 1500 pounds discharge pressure.

Complete adaptability to the job plus GASO design throughout is a time-tested guarantee of thoroughly dependable service extending far beyond the normal life expectancy of pumping equipment.

In the GASO line you will find the effective answer to any pumping problem associated with water flooding. Write for our 1960-61 catalog, or get in touch with our nearest distributor.



Gaso Pump in salt water disposal service in Louisiana

GASO PUMPS
for every oil industry need

GASO PUMP & BURNER MFG. CO.
FIRST and LANSING STS., TULSA, OKLAHOMA
EXPORT OFFICE: 2712 EMPIRE STATE BLDG.
NEW YORK, N. Y.

SEND FOR OUR 1960-61 CATALOG

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Farmington, N. M. – Gaso Pump & Burner Mfg. Co. • Shreveport, La., Odessa, Texas, Brookhaven and Tinsley, Miss. – W. L. Somner Company • Houston, Texas – Texas Pump & Compressor Company • Wichita Falls, Texas – Pump Engineering Co. • Evansville, Ind. – Hague Equipment Co., Inc. • Long Beach and Bakersfield, Cal. – Power Pumps, Inc. • Casper, Wyoming – Lufkin Foundry & Machine Co. • Edmonton, Alberta – Lufkin Machine Co., Ltd.

MR. JAKE L. HAMON

President, Hamon Oil Company
Past Chairman of the Board
American Petroleum Institute, 1956-1957

"Valued Partners . . ."

"My business is drilling for oil and gas. If the wells are successful, I must produce them efficiently and economically.

"I consult the service and supply men whenever drilling is started in a new territory. They quickly give me the correct information on the area, because they know the operating problems. This saves me valuable time and provides for a planned drilling program.

"We are continually faced with the problem of drilling and completing deeper and deeper wells. The research departments of the Equipment and Service Industries have developed new and better materials to get this job done. Without the improved equipment we would really be up the creek. The Supply Stores stock needed materials, eliminating burdensome and costly inventories for the operator.

"With the cooperation of the manufacturers, the American Petroleum Institute has done a great job in its standardization activities. Their men have served the committees faithfully, giving unselfishly of their time and knowledge. Because their plants and offices, in many cases, are located outside oil and gas producing states, they have assisted us in defending the depletion provision in those areas.

"Manufacturing, service and supply companies are valued partners to me. They are always 'Johnny-on-the-spot' with equipment, supplies and know-how, when and where it is needed. These companies are made up of loyal, determined, aggressive men who, through their dedication and willingness to sacrifice, are 'oil men' in the truest sense of the word."

P.E.S.A.

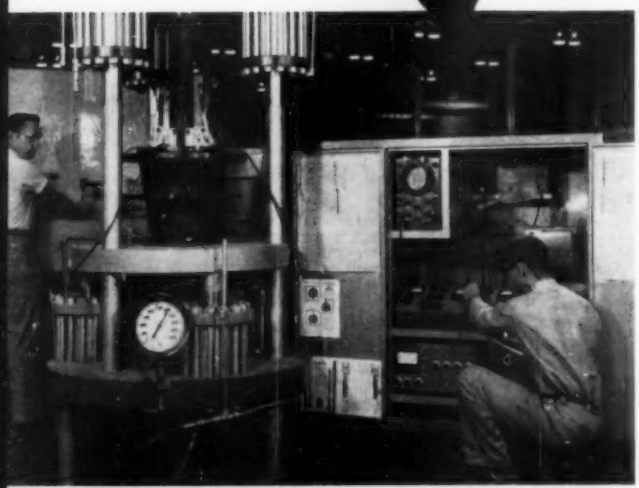
PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION

PROUD TO BE PART OF A PIONEERING INDUSTRY

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION

MISSION LIGHTWEIGHT SLIPS BUILT LIKE A BRIDGE FOR STRENGTH AND LIGHTNESS

MODEL 60



Mission Slips in 600,000 lbs. capacity slip test machine, with fourteen channel recording oscillograph measuring strains in slips and pipe.

Field and laboratory tests proved that these slips are built like a bridge with plenty of strength but no excess weight. They weigh only 135 pounds; so you won't break your back setting them. Yet, they have all the heavy-duty features you will ever need. You can hold drill pipe with hook loads of 275,000 lb. and drill pipe sizes 2⅜" through 5". The lightweight results from a new design based on sound and proved engineering principles.

Mission Rolling Dog teeth grip the hardest pipe available today with minimum stress concentration. New positive lock retains dogs in place. The standard rolling dogs and new solid inserts let these slips do the job of the heavyweights. You will find all the proved and popular Mission slip features: Segments are self-leveling as insurance against crimping the pipe. Top of slips is constructed to allow heavy elevator blows to be absorbed. Renewable hinge pins on these Lightweight Slips mean long life, less replacement. Flexible handles bend instead of break.

These new slips — built like a bridge — are one more proof Mission knows drilling problems and knows how to overcome them. Available at your supply store.

For over thirty years—quality built in to last

MISSION MANUFACTURING CO

MISSION MANUFACTURING CO., P. O. Box 4209, Houston, Texas
Cable Address—"Missco" • Export Office: 30 Rockefeller Plaza, New York
In The United Kingdom: MISSION MANUFACTURING CO., LTD.,
1 Hanover Square, London W. 1 England • Cable Address—"Missoman"

Pistons • Piston Rods • Slips • Gland Packings • Liners • Liner Packing • Pump Valves and Seats • Swabs • Valves • Hammerdrils • Centrifugal Pumps

Well Services

Portable Oil-Heating Unit

265 Southwest Welding Company has announced a new portable oil-heating unit being used for paraffin control. The unit can heat crude oil, water, condensate, etc. at a high rate to be pumped down a well by the pumps incorporated in the unit to remove paraffin from tubing, formation, and flow lines. It can also be used to heat-treat crude oil in lease storage tanks.

The units have 2-in. pipe coils for heating the fluids and are fired by LPG. Heating capacities range from 1,000,000 to 8,000,000 Btu per hr. *Southwest Welding Company.*

More, Faster Information During Fracturing Jobs

266 The Fracometer, an instrument developed by Halliburton Oil Well Cementing Company to help improve hydraulic fracturing, provides both visual and permanent continuous recordings of fluid injection rate, wellhead pressure, hydraulic horsepower, and sand-fluid density. A fifth measurement gives a visual reading of cumulative volume, in gallons, at any time during the job.

The Fracometer offers: a direct-measuring flow meter in the proportioner discharge; a converter that changes wellhead treating pressure to a low-pressure air signal; a computer which calculates hydraulic horsepower from the measured flow rate and pressure; a densitometer to determine fluid density; and operation by low-pressure air signals at remote location. Information from the instrument simplifies and helps make more accurate any complicated fracturing treatment involving variable injection rates, types of fluids, sand ratios, and other factors. *Halliburton Oil Well Cementing Company.*

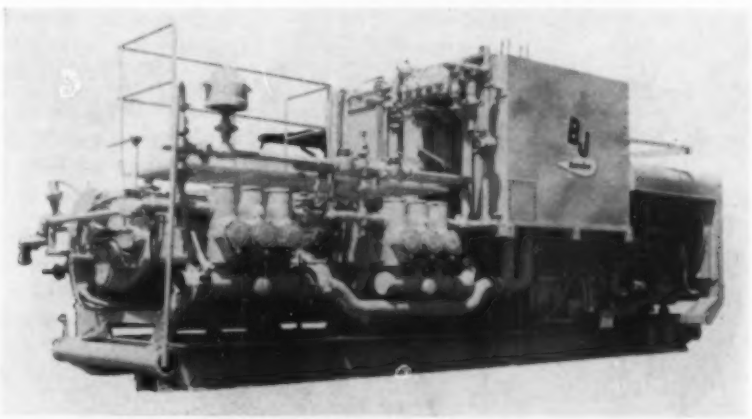
Process Ups Oil Flow In Sand-Packed Fractures

267 The Western Company has designed a new Slik-Sand process to increase oil flow rate in sand-packed fractures. The process utilizes a surface-active agent, WW-1, to increase effective permeability of the fine sand by converting the wetting phase of the sand from oil wet to water wet. The chemical is activated in the fractures by the presence of connate water. Amount of water needed to produce the desired effect is minute, and the conversion is completed within a short production period.

WW-1 is added to the frac oil and sand slurry in the blended unit during pumping operations and pumped into the formation with the slurry. By treating normal frac sand with the process, effective permeability of the sand to oil is greatly increased, aiding flow of the formation oil through the fracture to the well bore. *The Western Company.*

Acid Guide Released To Predict Performance

269 Released by Dowell Division, Dow Chemical Company, is a new acid guide to enable planning and predicting effectiveness of oil well acidizing treatments. Based on a series of curves derived from a detailed study of thousands of acid treatments on many kinds of wells and reservoirs, the new engineering guide provides a means of balancing the type and volume of acid against the injection rate to secure optimum reservoir penetration. Through its use, it is possible to predict advisability of treatment for a specific well as well as predict probable production increase to be expected from a given acid treatment. Field results have shown a high degree of correlation with such predictions. Now available for distribution, the acid guide is similar in scope to the firm's recently-released frac guide. *Dowell Division, Dow Chemical Company.*



High-Pressure Cementer Doubles As Frac Unit

268 A high-pressure cementing unit for use outside the U. S. has been introduced by BJ Service, Inc. Designated Model 1020, the cementer doubles as a fracturing and high-pressure pumping unit. When cementing, its inside pump picks up water from the central displacement tank and discharges it to a jet mixer to form the slurry. The slurry is picked up by the unit's outside pump and discharged to the wellhead. When not mixing cement, both pumps discharge fluid to the wellhead simultaneously.

All operating controls and gages are located at a central control panel near the displacement tank. Valves are manually controlled with the exception of those on the tank suction, which are air operated. The unit is equipped with triplex plunger pumps, powered by a 335-hp diesel engine.

With 4-in. plungers, the unit is rated at 790 gal per min at 0 psi and 100 gal per min at 10,000 psi; with 4½-in. plungers, maximum capacity is 960 gal per min at 0 psi and 100 gal per min at 8000 psi. The unit can mix and introduce into the well from 30 to 35 sacks per min (120-lb slurry). *BJ Service, Inc.*

Here's how one operator

SAVED 5 DAYS RIG TIME

with new Johnston tool!

Mr. Ernie Walker, Drilling Superintendent, Calvert Drilling Co.

The Jordon #1 was drilled by Calvert Drilling Company in Dewey County, Oklahoma and bottomed at 11,000 feet.

Drilling the well accomplished only part of the job. Now it became necessary to evaluate all possible producing zones and complete this well if it proved commercially productive. Just as during drilling operations, any delay in evaluation is costly. An idle rig, inoperative tools, equipment breakdown, needless action—all mean lost dollars.

The job of determining subsurface formation conditions was given Johnston Testers. **A total of nine Selective Zone Tests were run:**

Test interval—9534 to 9550 feet. Dual packers top and bottom. Used Johnston Selective Zone Anchor. Good test! Released tool, picked up 8 feet to interval 9526 to 9542 feet. Re-set tool. Another good test!

Test interval—9564 to 9685 feet. Dual packers top and bottom. Used Johnston Selective Zone Anchor. Formation failed to support mud weight. **Picked up tool and re-set seven times at different intervals.** Anchor worked perfectly, did not slide at any time!

The ability to set, release and re-set the Selective Zone Anchor allowed testing of many zones with just one trip in the hole. Extra time was saved since long tailpipe did not have to be run.

Selective Zone Testing with the new "CO" Combination Shut-In Hydraulic Tester and the new Selective Zone Anchor can save you money, too! Call Johnston Testers and learn why you get more from a Johnston Test!

JOHNSTON TESTERS, INC.

P. O. Box 98 Houston 1, Texas

Turbine Fracture Pump Field Tests Scheduled

270 A turbine-powered fracturing pump featuring a 4-speed transmission for complete flexibility in operational ranges, is scheduled for field testing late this summer by Western Company. The unit mounts the firm's new RB-100 triplex pump powered by a Solar gas turbine engine, on a bobtailed truck. Tests so far indicate the unit capable of delivering more than 1000 hydraulic hp through a broad range of pressure-volume ratios. Other advantages claimed are high capacity from a single unit, low weight per horsepower, improved reliability, and reduced operational costs. Engine horsepower is in excess of 1250. *Western Company.*

New Well Swabbing Concept For Inaccessible Locations

271 Offered as a new well swabbing concept by Tretolite Company, is a chemical product 1¼-in. in diam and 24-in. long called a Swabstix flow inducer. Primary purpose is for use in inaccessible wells that have ceased to flow because of the overbalance of the fluid head when fluids accumulate in the tubing.

Application is a 1-man operation and consists merely of dropping the required number of units down the well tubing. Each consists of a water-soluble, oil-insoluble plastic cylinder filled with powdered chemical, highly reactive with water or brine. After uninterruped fall through the oil phase, the oil-insoluble jacket is penetrated in 30-min or 1 hour after contact with water or brine. The gas generated by each unit is sufficient to displace approximately 500 ft of fluid in 2-in. tubing. *Tretolite Company.*

Stimulation Technique Improves Acidizing

272 An unconventional new well stimulation technique developed by Dowell has yielded excellent results in the Permian Basin. Essentially, the treatment consists of high-speed injection of a special slow-reacting acid. This solution, which does not include sand, is pumped into the formation at pressures capable of opening natural fissures in the rock, allowing the acid to penetrate appreciable distances from the well bore. At the same time, the acid attacks the exposed rock surfaces, dissolving away the more soluble portions, and leaving the surface rough and furrowed. When treating pressures are released and the fissure "heals," acid-induced irregularities provide numerous high-conductivity channels through which well fluids easily flow.

Two types of acid solutions have been used: one for predominantly calcareous or dolomitic formations, the other designed for low-solubility, siliceous rocks. *Dowell Division of The Dow Chemical Company.*

Lightweight Frac Pump

273 Designed for well servicing application is a new quintuplex plunger fracturing pump which weighs 5000 lb, compared with 13,000 lb for competitive 3-cylinder pumps. The compact unit eliminates nearly two-thirds of customary surge, report its developers, Frank Wheatley Pump & Valve Manufacturers. Two of the 450-hp units can be mounted back-to-back on a truck and remain within the 8-ft road limits.

Additional features include a removable 1-piece cylinder head stuffing box, offset crank shaft for reduced power end loads, power ends fabricated from T-1 steel, optional force-feed lubrication system. Designated F-100, unit has 2½-in. discharge and 3, 3½, and 4-in. plungers. *Frank Wheatley Pump & Valve Manufacturers.*

Firm Offering New Tubing Descaling System

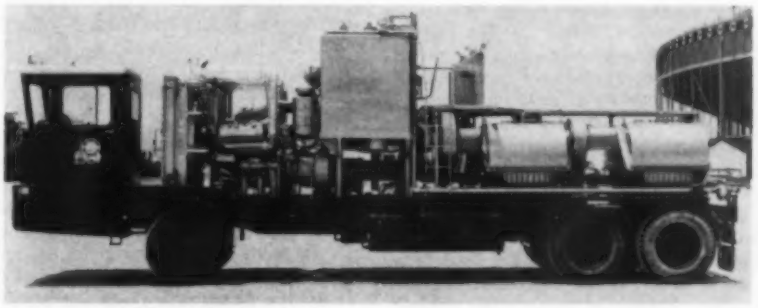
274 A new tubing descaling system has been developed by Klampon Corporation. Designated Hammerhauk Descaler, the system utilizes 2 basic principles working together. Hammering action generated by the pneumatic machine sets up high frequency and amplitude of physical vibration, placing this shock load on the tubing wall and breaking loose scale deposits.

The second principle is used to bring tubing ID to original drift diameter through use of specially-designed cutter-gage rabbit which is pulled downward through the scale from top to bottom by gravity. Vibration set up in the tubing by the machine produces cutting and beating against the cutting edge of the rabbit. Cutter-gage rabbit will then move down through tubing, cleaning and gaging. *Klampon Corporation.*

Drillpipe Inspection Tool Mobile, Self-Energized

276 Designed to monitor and record drillpipe physical conditions quickly and accurately is a mobile, self-energized inspection tool from Universal Inspection & Service Company. Termed the Teleflaw electronic pipe inspector, the tool travels along each joint of pipe, generating a magnetic field which is automatically monitored for interruptions caused by cracks, pits, gouges, and scratches. Results are tabulated on a strip chart recorder.

A magnetic particle inspection service uses residual inspection method with an electronically controlled energy storage system to magnetize the pipe. Energy for both units is available through outputs for the current-carrying bar through the pipe, and for coils used on end areas. Electronic switch controls the output, assuring proper magnetization. *Universal Inspection & Service Company.*



Cementing Unit For High-Pressure Work

275 An oil well cementing unit boasting 700 bhp and fingertip controls has been designed by Stewart & Stevenson for high pressure service. The unit is equipped with two 350-hp diesel plants, mounted side by side just behind the cab. Remote control console is on operator's deck adjacent to displacement tank. Transmission and engine controls are in a 1-man cab controlled remotely through air and hydraulically operated systems. Two cementing pumps are triplex with 4-in. plungers and special valves and seats. Pumps will produce approximately two bbl per min at 10,000 psi; 4 bbl per min at 5000 psi; 8 bbl per min at 2500 psi and 16 bbl per min at 1250 psi. *Stewart & Stevenson Services, Inc.*

PAUL H. JOHNSON • JAMES R. HEAD

PATENTS: Incentives to progress

Our patent system has created what Abraham Lincoln called "the fuel of interest to the fire of genius" and is a major spur to the continued development of new equipment and services

PATENTS HAVE HAD a long, eventful and colorful history. From their initial conception as a form of monopoly handed out as plum to the favorites of monarchs down to the present day where they are a main spur to industrial development, patents have undergone many changes. At times struggles have been required to keep alive our great patent system.

Birth of Patents

Patents originally came into existence as a means whereby reigning princesses used the prerogatives of their offices to grant privileges and favors in the form of a monopoly as a reward to those who had gained their favor. An example of such patent would be the exclusive right to sell wine in the city of London. These patents became so numerous, so oppressive and so unjust that a statute was finally enacted, declaring monopolies that were grievous and inconsistent to the interests of the subjects of the realm to be void.

However, a phrase in this statute which made void all patents in general provided an express exception in favor of first inventors of new manufacture. From an industrialization standpoint this phrase retaining inventive monopolies has had greater influence than probably any other phrase recorded in all of the law. Upon this phrase hangs most of the patent laws both of England and the United States, and to a great extent is the forerunner of the patent systems of many other nations of the world.

The first patent for a new invention that can be found on a search of the records covers a patent issued to an inventor in 1561 in England, and covers the method of manufacturing salt petre. In 1602, Francis Bacon, in the House of Commons, supported the principle that a monopoly or patent should be granted only for a new manufacture. This led to the enactment of the statute eliminating all patents but for invention.

Constitutional Right

In 1787, when the founders of our nation gathered together in Philadelphia to draft the Constitution of the United States, a meeting was held by a small group, a committee presided over by George Washington. Those present included Jefferson, Hamilton, Morris, Pinckney and Madison. Madison and Pinckney have been ascribed as the authors of the clause which brought patents into the New World's government. The clause, as it reads in the constitution, is

> "That Congress shall have power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

Upon this clause the industrial might of the United States has been grounded.

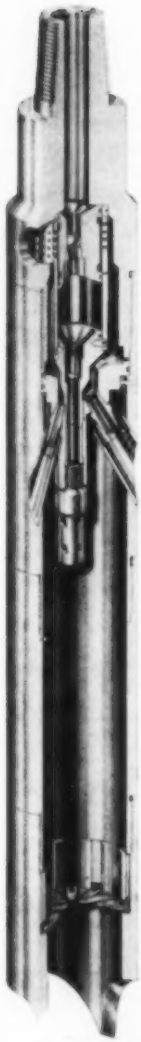
On April 10, 1790, George Washington signed the first patent bill. It specified that the subject matter of a patent would be any useful art, manufacture, engine, machine, or device, or any improvement thereon not before known or used. A board was established and given the responsibility for granting patents. The board consisted of the Secretary of State, the Secretary of War, and the Attorney General. The Department of State was given the responsibility for administering the patent laws. The board was given the power to grant patents if they deemed the invention sufficiently useful and important for a period not to exceed 14 years, and the board fixed the duration of each patent when the patent was issued. The members of the first Patent Board were Edmond Randolph, Attorney General, Henry Knox, Secretary of War, and Thomas Jefferson, Secretary of State.

Since the State Department was charged with administering the Patent Act of 1790, Thomas Jefferson assumed the responsibility. It appears from available records that Thomas Jefferson made a personal examination of every application that came before the Board. Thomas Jefferson's insight and intellect gave a great impetus to the patent system in the new nation, and no doubt his influence has been felt to this day.

Thomas Jefferson was a truly outstanding man, and not only was he a lawyer, statesman, farmer, architect, mathematician, astronomer, student of languages, a primary author of the Declaration of Independence and of the Constitution of the United States, but he was also an outstanding inventor. His primary invention was an improvement in the method of manufacturing mold board plows. This invention revolutionized agriculture and helped promote the development of the agricultural industry in the United States. The invention was so significant that Jefferson was decorated for the invention by the French Institute. Among Jefferson's other inventions are listed a revolving chair, a folding chair which doubled as a walking stick, a machine for treating hemp and a pedometer.

One only has to take a trip to Thomas Jefferson's home, Montecello, near Charlottesville, Virginia, to be enraptured by the great creative genius of Thomas Jefferson. His home is filled with ingenuity in every detail of construction. One of the features of his home which is intriguing to engineers is a pair of swinging doors so designed that when one door is opened, the other swings open conjointly. His engineer-

The authors are patent attorneys in Tulsa, Oklahoma, and have had extensive experience in patent work for two major oil companies. Both are members of the Oklahoma Bar and the Patent Office Bar. In addition, Mr. Johnson is a graduate electrical engineer and a registered professional engineer in Oklahoma. Mr. Head is a graduate mechanical engineer. This broad educational and professional background makes the authors well qualified to write about petroleum patents.



Cutaway of Wilson Jet-Powered Junk Retriever. Complete specifications and operations available in booklet form.

Great Western Drilling Co. Rig #44 on deep test for The Atlantic Refining Co., Kelly #1, Pecos County, West Texas.

(Left to right) J. D. Mosley, toolpusher, Great Western Drilling Co., Rig #44; P. E. Todd, Wilson Supply Fishing Tool Division, Odessa, Texas; Bob Foster, driller, Great Western Drilling Co., Rig #44.

Wilson "Jet-Powered" Junk Retriever Cleans 18,121 ft. West Texas Hole

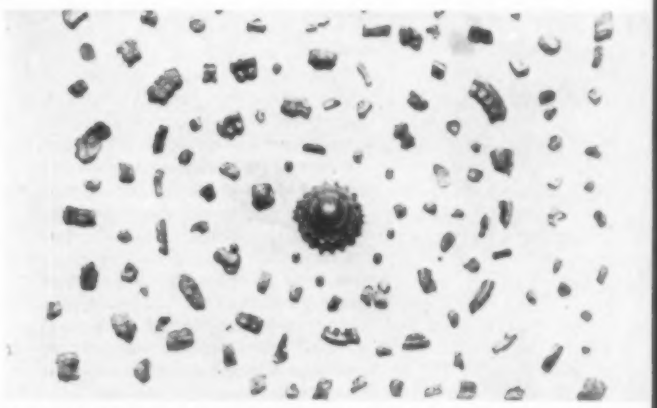
Only on bottom for 4½ hours recovering bearings and 4⅛" rock bit cone

A 3⅝" Wilson "Jet-Powered" Junk Retriever on 2⅜" Internal Flush Drill Pipe was run to 18,121 feet to recover junk and rock bit cone in a deep West Texas drilling test. The Wilson Junk Retriever was on bottom for 4½ hours and successfully cleaned the hole.

Two 700 hp pumps at 2000# produced only 110 gallons of fluid per minute through the 1" I.D. (2⅜" O.D.) pipe on which the Wilson Junk Retriever was run. Even with this small volume of fluid the tool's built-in ejector pump functioned properly and forced the 4⅛" bit cone and other miscellaneous junk into the tool's sleeve.

This is just one of many successful fishing jobs recorded by the Wilson "Jet-Powered" Junk Retriever. The tool is simple to operate, effective in performance and is available for use by all recognized fishing tool companies. In this instance the tool was run by M & B Fishing Tool Co. of Odessa.

The next time you have a junk-removal problem, call WILSON. You'll save time and money . . . and you'll get the **right** men with the **right** tools to handle your fishing job safely — quickly.



Photograph taken at rig location of the junk removed by the Wilson Junk Retriever at 18,121 ft.

MAIN OFFICE and WAREHOUSE • 1301 CONTI STREET • HOUSTON, TEXAS
INTERNATIONAL DIVISION • 45 ROCKEFELLER PLAZA • ROOM 1701, NEW YORK

WILSON SUPPLY CO
HOUSTON TEXAS

6023

ing design was so superb and the mechanism so well constructed that the device, positioned beneath the floor, has worked successfully from the date of installation, over 150 years, without repair.

Almost a quarter of a century after Jefferson became acquainted with the patent office procedures as the first "examiner" of patents, he had this to say:

> "An Act of Congress authorizing the issuing of patents for new discoveries has given a spring to invention beyond my conception. Being an instrument in granting the patents, I am acquainted with their discoveries. Many of them indeed, are trifling, but there are some of great consequence, which have been proved by practice, and others which, if they stand the same proof, will produce great effect."

Patent Legislation

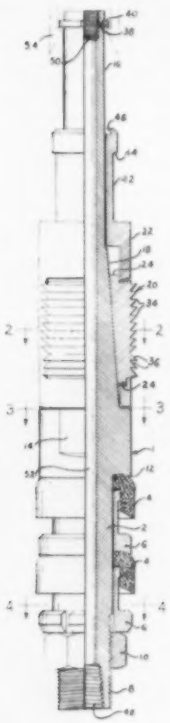
An inventor by the name of Samuel Hopkins of Vermont, was granted the first United States patent, for a method of making pot and pearl ashes. In 1793 an additional patent act was adopted abolishing the patent board and establishing the authority of granting patents upon the Secretary of State. Under this act, all inventors who applied for patents and who submitted the proper drawings, and paid the necessary fee, were granted a patent. No examination was required before the patent was issued, and even the requirement that the invention be sufficiently useful and important had been removed.

In 1836 another act was passed by Congress, re-establishing the examination system in the allowance of patents. This was the first Act providing for a Commissioner of Patents. However, the Commissioner was to be the head of a separate bureau in the Department of State. The act of 1836 required that each application be accompanied by a model. Also in this act for the first time, appeals were permitted if the examiner refused to issue a patent.

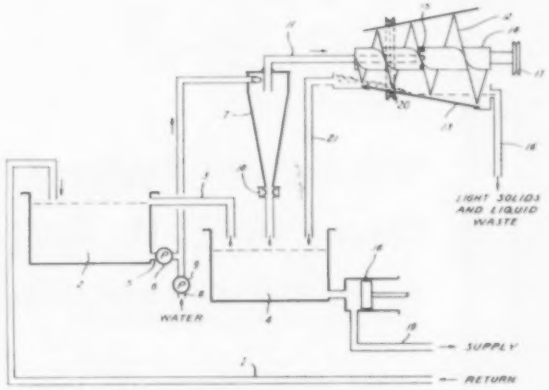
U. S. Patent No. 1

In July of 1836, the present numbering system for patents was begun, and since that time, patents have been

These patent illustrations and brief descriptions of some recently issued patents applicable to the petroleum industry are examples of inventions which are filed every day in the U. S. Patent Office and which, in total, help the oil operator to find and produce more oil and gas at less cost.

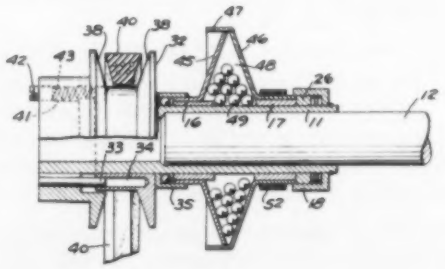


This invention refers to improvements in slip devices used to hold packers and flow control devices at positions within a pipe or tubing. The tool is set in the tubing by exerting an upward pressure with a lowering tool 54 on the body portion 16, which is tapered 18 to force slips 20 out against the tubing. When set, cups 4 serve to prevent the passage of fluid and gas. To retrieve the packer a retrieving tool engages lip 44 to pull the slips up to a narrower portion of taper 18 so that they will retract and loosen their grip on the tubing. An object of the invention is to provide a slip device which may be maintained in place without a special anchor rod, and a further object is to provide a slip that will hold the tool against movement in any direction until it is released.



When drilling mud is returned from the hole it is desirable to separate and discard as much of the light solids as possible while retaining the heavy solids. This invention incorporates a cone separator 7 in conjunction with a rotating cone-shaped housing 13 having a rotating screw 12 operating therein. Liquids and light solids which are ejected through line 11 from cone 7 pass into hub 14 of helical screw 12. These light solids and liquids pass out of hub 14 through openings 15. The rotation of housing 13 combined with the rotation of screw 12 causes the heavier solids to be moved forward and into discharge line 21 where they are returned to recovery tank 4 for re-use. The liquids and lighter solids flow out conduit 16 and are thus eliminated from the mud system. This combination results in a greater recovery of the heavy solids such as barites which are an expensive portion of drilling mud.

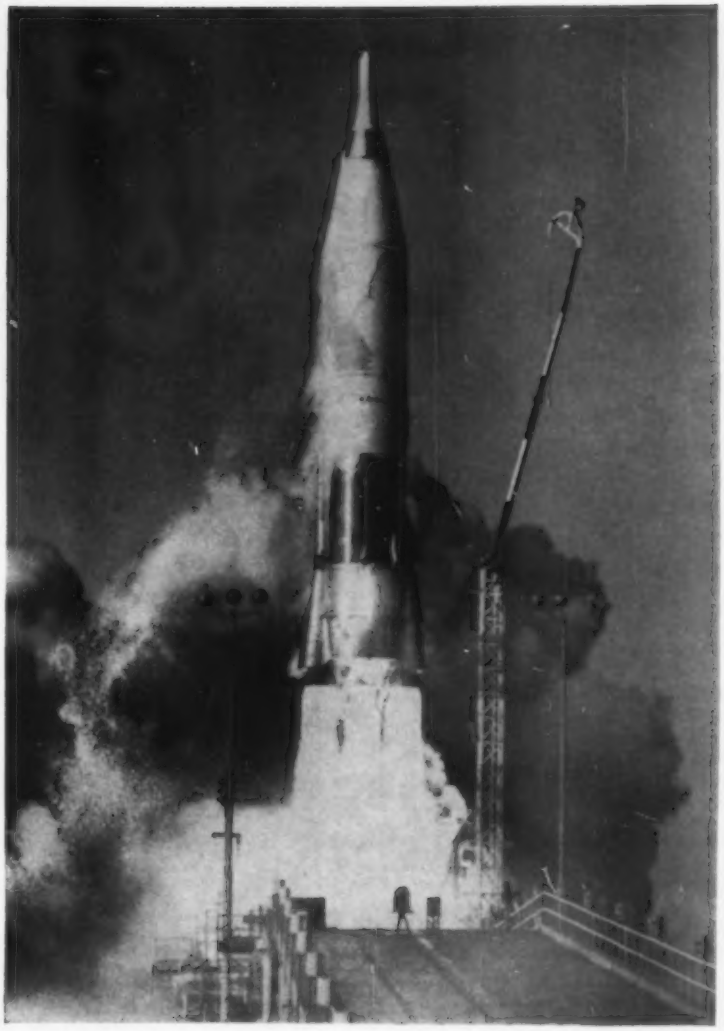
An object of the invention is to provide a simple centrifugal clutch structure which will remain disengaged at low engine speed, but will engage when the engine is accelerated to running speed. When shaft 12, which is connected to the engine, is turning at a low rpm, springs 43 will force housing members 45 and 46 together which separates the pulling members 32, permitting slack in belt 40 so that no energy is supplied to the belt. When shaft 12 is rotated faster the shot 49 forces housing members 45 and 46 apart, compressing springs 43 and closing pulling members 32 on the belt 40 to transfer energy to it.



Like Convair's mighty Atlas missile,

Rector

casing heads are "SEALED WITH STEEL"



The mighty Atlas missile is built to withstand all extremes of temperature change, from searing heat developed in the combustion chambers to extreme low temperatures encountered hundreds of miles from the earth in outer space.

The same welding principle that insures strength and safety in this giant of the rocket age, insures a perfect completion every time in Rector casing heads. Rector casing heads utilize a precision ground joint seat fitted with a welding ring which is welded directly to the casing. An API ring gasket completes the exclusive *ring of steel* pioneered by Rector.

See your Rector representative or your favorite supply store.

MONOGRAMMED EQUIPMENT CERTIFICATE NO. 2158

Rector

WELL EQUIPMENT CO., INC.

Making the Oil Industry Safer!

1100 North Commerce • Fort Worth, Texas

Houston Plant: 2215 Commerce Street

Export Representatives:
Continental-Emsco Co., Mid-Continent Supply Co., Oilwell Division of United States Steel Corporation

McCullough

PERFORATING SERVICES

Here's the most complete, most efficient line of perforating services available to the oil industry – all designed with one objective – to get more oil, *best* possible production!

Choice of the type perforating process to be used depends on the nature of the formation to be penetrated and the method of well completion; whether in full size casing, thru-tubing or in slim holes.

At McCullough you'll find bullet and jet guns, in a variety of types and sizes, to handle every requirement – quickly, efficiently and profitably – your *best* bet for *best* production!

FOR PERFORATING IN CASING

McCULLOUGH BULLET GUNS – World's hardest shooting bullet guns. Best available perforating process in all formations except extra hard.

McCULLOUGH GLASS JET GUNS – Most versatile and efficient of all jet casing perforators. Deep penetrating, carrot-free, junk-free. Uses flexible, retrievable Steel Strip Carrier. Gets best results in hard formation.

McCULLOUGH TUBULAR CASING JET GUNS – Star Jet, DuPont, Dynajet and Super Dynajet charges are available in most areas to meet varying well conditions.

TORPEDO JET GUNS, expendable type perforators for cased and open hole operations. Offered in limited areas.

FOR THRU-TUBING AND SLIM-HOLE PERFORATING

McCULLOUGH SECTIONAL BULLET GUNS – Only small diameter bullet guns made. Sizes are 1⅝", 1¾" and 2¼" OD. Backed by a record of more than 20 years of fine performance.

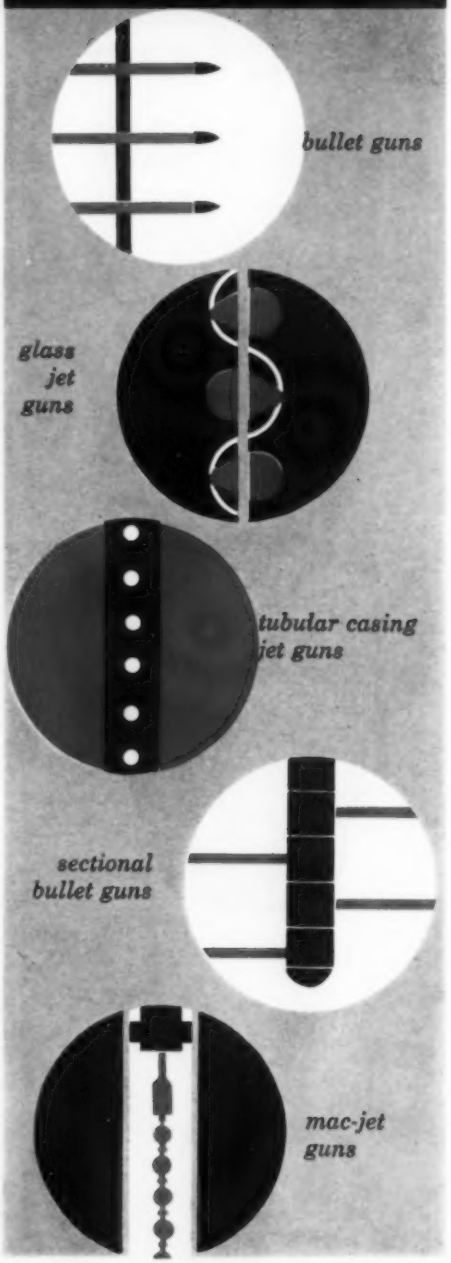
McCULLOUGH MAC-JET GUNS – Finest and most advanced of all small diameter, expendable jet guns. Features include enclosed firing system, minimum debris, deep penetration, high well flow index, carrot-free. Widely used in both thru-tubing and slim hole work.

OTHER SMALL DIAMETER GUNS include the **LINK JET** and **TORNADO JET,** expendable thru-tubing perforators; and the **SIDEWINDER,** a retrievable jet perforator for slim hole operations.

SPECIAL APPLICATIONS

McCULLOUGH FOUR-WAY SQUEEZE JET GUNS – designed to assure even distribution of cement around casing. **FRAC-JET** – fires eight jets on a horizontal plane for fracture placement.

your best bet for best production



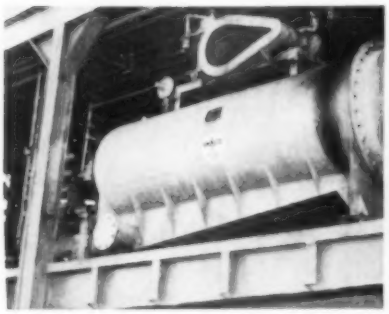
McCullough

TOOL COMPANY

Los Angeles • Houston • Edmonton • Cable Address: MACTOOL

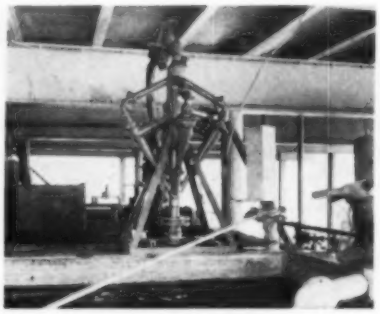
Three good ways to cut drilling costs

The three units shown here are important items behind the recent revolution in drilling fluids that has done so much to speed drilling and cut costs. Each is designed for a different problem but all are efficient and economical. Equally important, all are handled by SWACO -- the leader in mud-treating equipment.



SWACO D-GASSER®

Operators frequently report saving the entire rental cost of a D-Gasser on a well in less than a day.
When mud is gas-cut, the D-Gasser saves money in many ways. It cuts time lost for circulating after trips. It reduces barite costs, it minimizes lost circulation costs and problems. It maintains mud pump efficiency and it actually makes possible the close control of mud weight and viscosity that results in faster drilling with increased safety.



CLAYJECTOR®

If you are using mud as heavy as 12 pounds per gallon, you can cut mud costs and increase drilling rate by using a Clayjector. This is a cyclone-type separation unit that is extremely effective at rejecting unwanted clays and retaining expensive barite.
In addition, since it makes possible the economical maintenance of a low-solids, low-viscosity mud, it actually permits a reduction in bit costs and drilling time.

D-SANDER®

The D-Sander greatly increases the life of mud pump parts and bits when sand or abrasive shale is being drilled. Since it removes virtually all sand-sized solids from the mud, excessive pump-parts and bit-nozzle wear — as well as many other problems — are avoided when a D-Sander is used. There is a size and type to fit every rig and drilling condition.

These descriptions tell just a few of the many ways you can cut costs by mechanical mud treating. For the full story on how you can profit, call your nearest SWACO representative or write us direct.

SWACO

SALT WATER CONTROL, INC.
1809 CONTINENTAL NATIONAL BANK BLDG., FORT WORTH 2, TEXAS
Telephone: EDison 2-4433 Cable Address: "SWACO" Fort Worth

LOUISIANA: New Orleans, Lafayette
OKLAHOMA: Oklahoma City
TEXAS: Houston, Corpus Christi, Fort Worth, Kermit
COLORADO: Durango

FOR FURTHER INFORMATION ON ADVERTISED PRODUCTS, SEE READER SERVICE CARD

another first from Reed!

THE "2-IN-1"

Comet

NEWEST OF ROCK BITS - EXCLUSIVELY REED

...actually two bits in one!

The new Reed Comet bit combines steel teeth with tungsten carbide inserts and achieves superb digging capacity with maximum crushing action. This unique new bit is tremendously effective in hard abrasive formations such as chert, sand rock, quartzite, granite, and flint.

This new bit (Reed's exclusive design) is the answer to your problems when you drill in non-uniform formations which vary from considerable hardness and abrasiveness to extreme hardness, abrasiveness, and high compressive strength.

The Reed man who calls on you has the complete story on this NEW Reed bit. He'll be glad to give you the full story on *all* Reed products.

(Available now in 7⅞", 8½", 8⅝" and 8¾" sizes.)

REED ROLLER BIT COMPANY *Houston 1, Texas* EXPORT OFFICE: 1011 INTERNATIONAL BLDG., NEW YORK 20, N.Y.
GULF COAST, MID-CONTINENT, ROCKY MOUNTAIN AND CANADIAN DISTRIBUTOR FOR MARTIN DECKER PRODUCTS

REED

REED'S ROLLIN'

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- FLINT
- TACONITE
- NOVACULITE
- CHERT
- QUARTZITE
- PYRITE
- CHAT
- DOLOMITIC SAND
- QUARTZITIC SAND

SPERRY-SUN
Serving the
Oil Industry for Over
a Quarter of a Century
ORIGINATORS OF BETTER METHODS AND DEVICES FOR MORE ACCURATE OIL WELL SURVEYS AND EFFICIENT DIRECTIONAL DRILLING
ORIGINATED first straight hole instrument (the Syfo Clinograph) generally accepted by the industry.
ORIGINATED only gyroscopic bore hole directional instrument in use in the United States.
ORIGINATED use of non-magnetic drill collars—an outstanding contribution to directional drilling.
ORIGINATED orientation of directional drilling tools in the bottom of hole. (Directional drilling could not be economically done without this Sperry-Sun method and the use of non-magnetic drill collars.)
ORIGINATED the taking of side wall cores.
. . . AND SPERRY-SUN IS STILL THE LEADER WITH THESE OUTSTANDING INSTRUMENTS AND SERVICES
• SPERRY-SUN MAGNETIC DIRECTIONAL SINGLE SHOT
• SPERRY-SUN E-C INCLINOMETER
• SPERRY-SUN (MAGNETIC) MULTI-SHOT DIRECTIONAL SURVEYS
• SURWEL (GYROSCOPIC) MULTI-SHOT DIRECTIONAL SURVEYS
• K-MONEL NON-MAGNETIC DRILL COLLARS
• M-M-O MAGNETIC METHOD OF ORIENTATION
SPERRY-SUN
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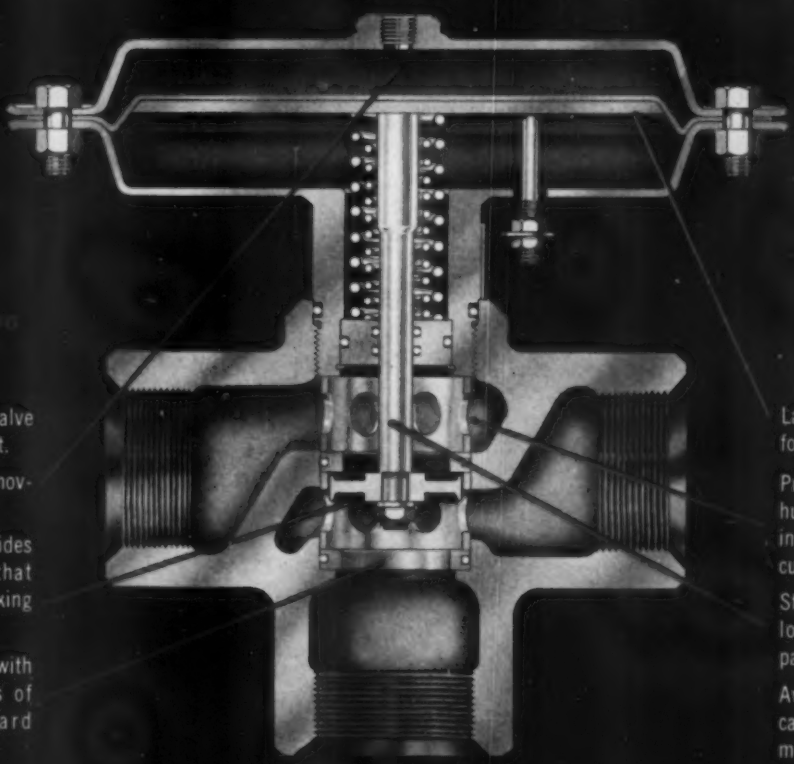
NEW

GARRETT DIVERTER VALVE

NEW LOW COST
NEW LOW MAINTENANCE
NEW OPERATING FLEXIBILITY



MONEY SAVING FEATURES

Lowest cost of any valve of this type on market.

All inner parts are removable from top.

Bonded soft seat provides bubble tight seal that holds under all working conditions.

Large flow capacity with 1.77 square inches of opening in standard 2-inch valve.

Large 8-inch diaphragm for low pressure operation.

Pressure drop occurs in huddling chamber protecting seat and disk from cutting action.

Stainless steel trim gives longer life to exposed parts.

Available in shop fabricated and tested skid-mounted headers.

USI **Garrett Oil Tools**

Division of U. S. Industries, Inc. P. O. Box 2427, Longview, Texas

The new Garrett TPOR-1 Diverter Valve is an economical three-way two-position valve for low pressure automatic well testing systems and other applications where it is necessary to divert flow. Engineered for dependability and long life, the TPOR-1 Diverter Valve offers maximum flexibility of application.

Consult your nearby Garrett sales and service office for an economical solution to your control valve requirements . . . or write direct.

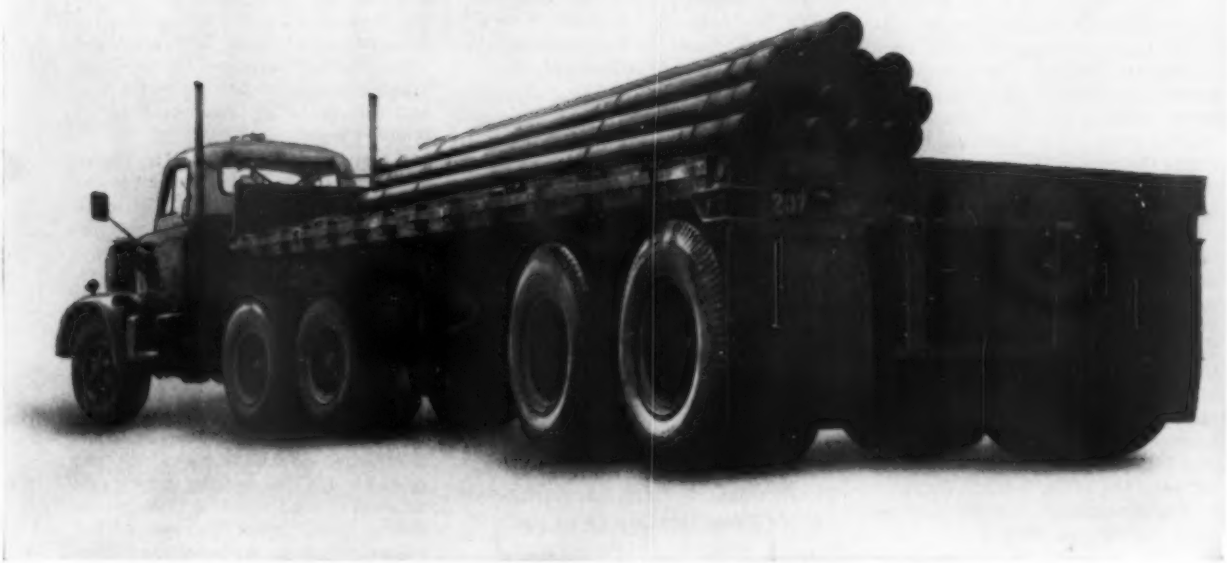
Invest $171

Investing $171 for a barrel of Duomeen® CD-50 is obviously less costly than shelling out $1700 for a load of new pipe.* Yet every year oil producers are paying out millions of dollars to replace pipe that failed, due to the corrosive environments in water systems. By using Duomeen CD-50, a combination corrosion inhibitor and bactericide, much of this needless expense can be avoided.

Extensive field tests have established sulfate-reducing bacteria to be one of the more important factors in causing corrosion. Thorough investigations have also proven the effectiveness of Duomeen CD-50 in preventing the harmful effects of these bacteria.

Additional savings result with the use of Duomeen CD-50 because many costly remedial measures are eliminated. Savings are effected by the prevention of

Save $1700



bacteria and bacterial by-product plugging, less down-time, and lower power costs to maintain injection pressures.

For complete detailed information on Armour's bactericides—corrosion inhibitors and other chemicals for oil production, write for the booklet, "Armour Organics for Increased Oil Production." Samples of Duomeen CD-50 and other Armour oil production chemicals for your own testing are also available.

**Basis: average savings on a 50,000 bbl./day water injection system, continuously using 20 ppm of Duomeen CD-50.*

Armour Industrial Chemical Company
©Division of Armour and Company
110 North Wacker Drive • Chicago 6, Illinois

FOR FURTHER INFORMATION ON ADVERTISED PRODUCTS, SEE READER SERVICE CARD

numbered consecutively. Patent No. 1, under the 1836 Patent Act, was issued to a Senator from Maine, John Ruggles, for an invention designed "to give a multiplied tractive power to the locomotive and to prevent the evil of the sliding of wheels" which he named "locomotive steam engine for rail or other roads." In 1870 an Act was passed, incorporating many minor changes which had been made in the previous 34 years. Among the new provisions was a statute requiring that models were to be furnished only when required by the Commissioner. In 1925 the Patent Office was transferred to the Department of Commerce and it is within the Department of Commerce that the Patent Office functions today.

In 1790, three patents were granted in the United States. In 1791 the number jumped to 33, but diminished to 11 in 1792. In the fiscal year ending June 30, 1958, the United States Patent Office granted 46,248 patents. During this same period, applications for patents arrived at the patent office to the total amount of 88,714. It can be seen then that the Patent Office has shown a continuous and substantial growth and this growth is in direct proportion to the inventiveness and creativeness of the American people.

The quickening strides of our economic development and continuous increase in our level of prosperity can be closely compared with the inventiveness of the people resulting in the number of patent applications received in the Patent Office. The number of patents continues on the average to increase each year. In 1936, 60,140 applications were received by the Patent Office. In 1950, the number was 69,117. In 1955, the number of applications received was 78,480.

Each invention opens a way for new inventions and improvements. For instance, consider the multitude of inventions made possible based on De Forrest's invention of the vacuum tube. The invention of the reaper by McCormick opened the way for the full mechanization of the agricultural industry which is still proceeding at an increasingly rapid pace today. On May 22, 1906, Patent No. 821,393, was issued to Orval and Wilbur Wright on a "flying machine" and the giant aircraft industry was born.

Monopolies and Patents

During the depression years a renewed antagonism grew up in the United States toward oppressive industrial monopolies. Some people thought the patent system was abiding the growth of these industrial monopolies. In 1941, President Franklin D. Roosevelt established the National Patent Planning Commission to conduct a comprehensive survey study of the American patent system, and among other things, to consider whether the system provided a maximum service in stimulating the inventive genius of our people in evolving inventions and furthering their prompt utilization for the public good. The president appointed Charles F. Kettering, Chairman of the Commission.

The report of the commission was transmitted by the president to Congress in June 1943, and contained the following statements: "The American Patent System established by the Constitution, giving to Congress the power to promote the progress of science and useful arts is over 150 years old. The system has accomplished all that the framers of the Constitution intended. It is the only provision of the government for the promotion of invention and discovery, and is the basis upon which our entire industrial civilization rests. The American people and their government should recognize the fundamental rightness and fairness of protecting the creations of its inventors by the patent grant. The basic principles of the present system should be preserved. The system has contributed to the growth and greatness of our nation; it has:

1. Encouraged and awarded inventiveness and creativeness, producing new products and processes which have placed the United States far ahead of other countries in the field of scientific and technological endeavors.

2. Stimulated American inventors to originate a major portion of the important industrial and basic invention to the past 150 years.

3. Facilitated the rapid development in general application of new discoveries in the United States to an extent exceeding that of any other country.

4. Contributed to the achievement of the highest standard of living that any nation has ever enjoyed.

5. Stimulated creation and development of products and processes necessary to arm the nation and to wage a successful war.

6. Contributed to the improvement of public health and public safety.

7. Operated to promote the individual and small business concerns during the formative period of a new enterprise.

The strongest industrial nations have the most effective patent systems, and after a careful study the commission has reached a conclusion that the American system is the best in the world."

In effect, the patent system has stimulated industrial competition rather than industrial monopolies.

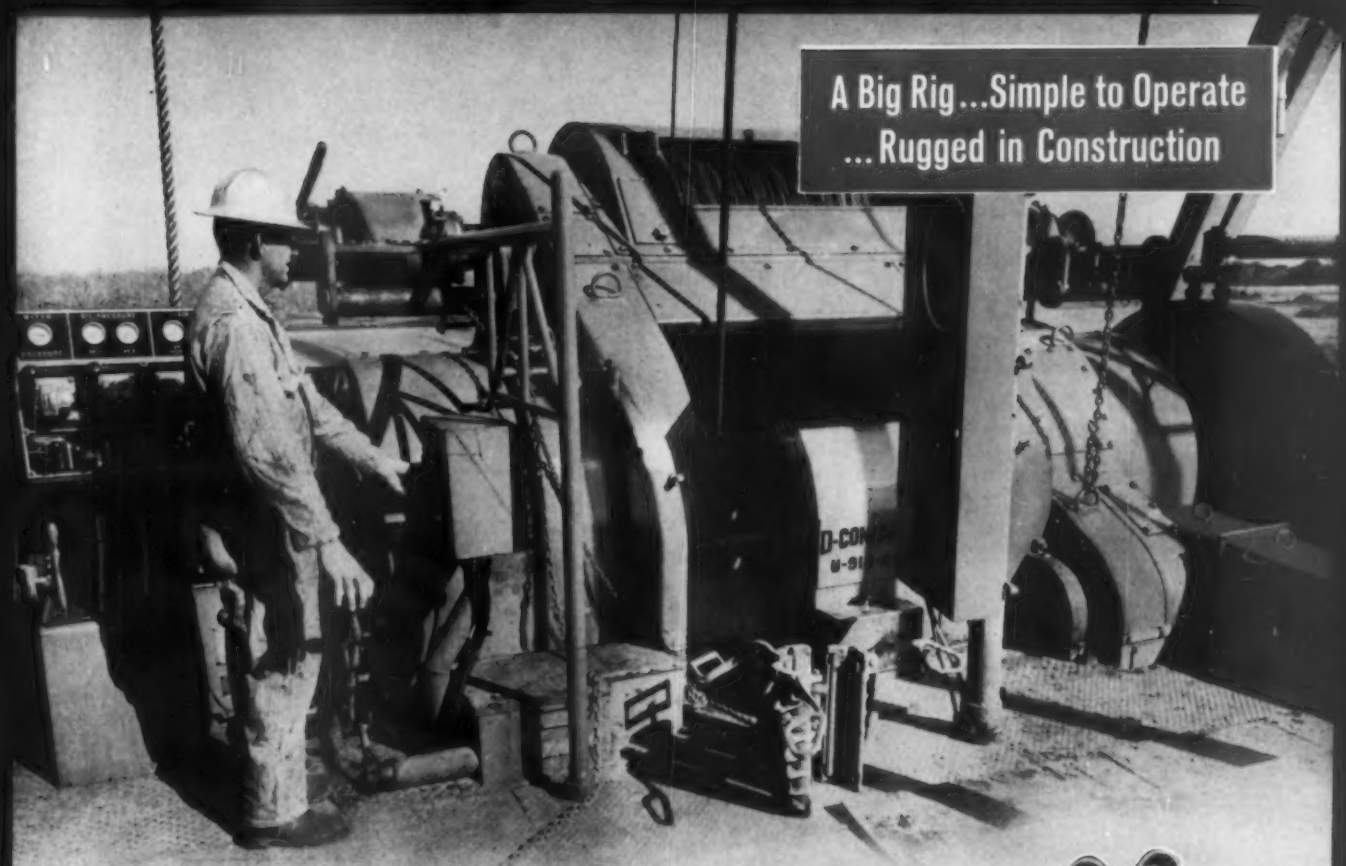
Patents Serve the Public

There are three main public benefits which are derived directly from the patent system. First, by offering patent protection, it induces the inventor to make inventions. Second, it encourages the inventor to develop and market his invention, thus giving the public the opportunity to use the invention. Three, since the inventor must describe his invention in his patent, and since copies of the patent may be purchased by the public for only 25 cents each, the knowledge of the invention is made available to everyone.

The great object and intention of the clause in the Constitution giving Congress authority to grant patents is to secure to the public the advantages to be derived from the discoveries of individuals and the means it employs are the compensations made to those individuals for the time and labor and money devoted to their discoveries, by granting exclusive right to make, use, and sell the thing discovered for a limited time.

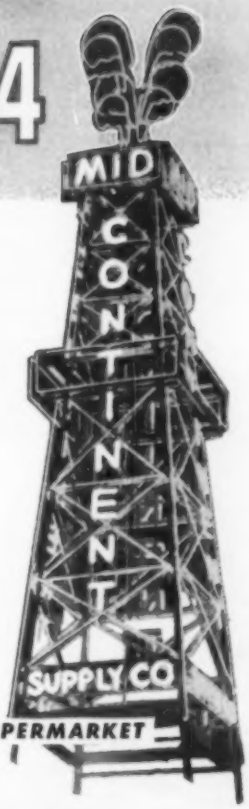
Abraham Lincoln said "The patent system added the fuel of interest to the fire of genius." Franklin D. Roosevelt said "The American Patent system has promoted countless applications of the arts and sciences to the needs and well being of our people."

A great contest is in the making. It is the contest between the system of free enterprise, of rewarding individuals for their intellectual achievements by the granting of patents, versus the communistic system of totalitarian industrialization, to determine which can produce for its people the largest measure of the fruits of intellectual endeavor. The capitalistic system has demonstrated its transcendence from the beginning of industrialization to the present time. Whether we can maintain this advantage will depend to a great extent on the proper functioning of our patent system. As long as our patent system can continue to function to "add the fuel of interest to the fire of genius" our ultimate triumph will never be in doubt. ★ ★ ★



MID-CONTINENT U-914

On location in South Texas, Stewart & Gouger Drilling Company's U-914 Drawworks is drilling "Deep Hole" for a major oil company. Rated at 900 to 1400 net input horsepower, this single package unit, single or double drum, is equipped with a 29" diameter by 53¼" long drum and self-equalizing, double adjustment brakes 10" wide by 52" outside diameter. Identical Fawick VC Clutches are mounted on the drum shaft for low and high drum drives, with an emergency splined clutch provided for the low drive. For dependable, economical and trouble-free drilling equipment, inland or offshore, call Mid-Continent today for complete information on the U-914.



ANOTHER FIELD-PROVED PRODUCT FROM THE OIL INDUSTRY'S SUPERMARKET

DW4-0

MID-CONTINENT SUPPLY CO.

THE WORLD'S LARGEST INDEPENDENT OIL FIELD SUPPLY COMPANY

Mid-Continent Building, Fort Worth, Texas • Export Division: 45 Rockefeller Plaza, New York 20, N.Y. Cable: MIDCUMPORT NYK

O·C·T

PRESENTS
THE ULTIMATE IN
LOW PRESSURE TUBING HEAD
SIMPLICITY, FLEXIBILITY, ECONOMY

Here it is . . . a low pressure tubing head that combines three all-important factors—*simplicity*, *flexibility* and *economy*.

With this new unit you can use tubing stripper in combination with other equipment if desired, without the necessity for adding stripper housing or bowl.

Threaded tubing hangers are available for use with or without the stripper.

Ease of installation: It's a cinch!

Ruggedness? It's tough as a boot!

When you need a low pressure head, you can get the best from

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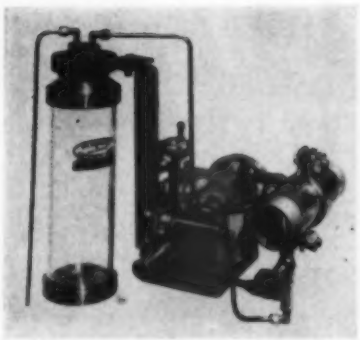
Address Export Inquiries for All Countries to
P. O. Box 3091, Houston, Texas.

where progress is a daily practice

NEW PRODUCTION EQUIPMENT



BS&W Samplers

277 Metrol's new RP BS&W sampler provides high sampling accuracy by use of a special sample nipple and a pump designed especially for sampling. The sample nipple contains a restrictive orifice and a pick-up tube. The perforated pick-up tube selects samples representative of the liquid flowing through the sample nipple. A portion of the by-pass flow through the pump is discharged into a sample container for BS&W determination by centrifuge.

Sample rates of ½ pint to 10 gal per 24 hr are available. Sample rates are independent of rate of flow through the pick-up tube. This sampler is available in working pressures up to 3000 psi. *Oil Metering and Processing Equipment Corp.*

Petro-Fluid Processors

278 One answer to problems connected with paraffin, scale, and emulsions in oil wells is a fluid processor introduced by Petro-Fluid Corporation. Tool is cast in special crystalline structure of bronze alloy metal which produces favorable influence on passing fluids. It is installed at or near bottom of producing wells, thus all incoming oils or oil combinations pass through. Process stabilizes waxes in solution, which in turn prevents its breaking out and adhering to inner walls of tubing and flow lines, and in most cases prevents occurrence of tight emulsions. *Petro-Fluid Corporation.*

Metering Separator Line Now Available

279 Now available is a full line of spherical and vertical metering separators featuring the capacity to handle large volumes with peak accuracy. The spherical separator is standard 2-phase and can be converted quickly to 3-phase through the addition of interface controller and control. Minimum turbulence is assured through internal baffles and each unit has a non-bleed, 2-float switch, which is reliable even on paraffin service.

The vertical separators utilize leading features of the standard 2-phase and 3-phase units, with the added feature of a precision-engineered calibrated metering chamber implemented with a reliable control system. Custom-designed components insure better removal of entrained liquid particles, agitation-free separation and stratification of water and oil, and close volumetric measurement. *Tyson Smith Company.*

Cathodic Protection System

280 Now being marketed by Cathodic Protection Service is a new system for internal cathodic protection of emulsion treaters and brine vessels. Simplified, ruggedly-built system is externally coupled for either magnesium sacrificial anodes or graphite impressed current anodes. Principle is based on forcing direct current to flow from the brine onto all surfaces of the structure, so the structure as a whole is cathodic and in a non-corroding state. *Cathodic Protection Service.*

Calcium Chloride Dehydrator Loader

281 A pneumatic chemical loader has been developed by the Rolo Manufacturing Company to more quickly and easily recharge the Rolo calcium chloride dehydrator. The loader, operated by one man, utilizes the suction from a portable gasoline engine-driven vacuum pump to elevate the dehydrator-grade (½ to ¾-in. pellets) calcium chloride to the top of the 20 to 25-ft vessels. *Rolo Manufacturing Company.*

Metering Separator Has Pneumatic Controls

282 A new metering separator featuring pneumatic controls and a mechanical counter that records each dump has been developed by M&V Tank Company. Separation is achieved by centrifugal forces imposed by diverting baffles at two inlets, through one of which the well stream enters. Fluid adheres to vessel wall until it strikes one of the vertical baffles and is deflected downward and degassed. Inlet gas moves to the mist extractor section through riser pipe at varying speeds determined by baffle action which also controls flow path before it leaves the separator. These flow and velocity changes cause oil mist to adhere to the bottom of baffles and migrate to their edges, where reduced gas velocity enables easy collection as mist drops off. Fluid migrates to mist extractor drain and down into the fluid section where liquid seal is maintained. It then enters the metering compartment through a 13-way valve. Upper level control closes inlet and opens outlet port to permit drainage from chamber. When fluid level has fallen, a lower control sends signal to 4-way pilot valve, reversing 3-way valve. *M&V Tank Company.*

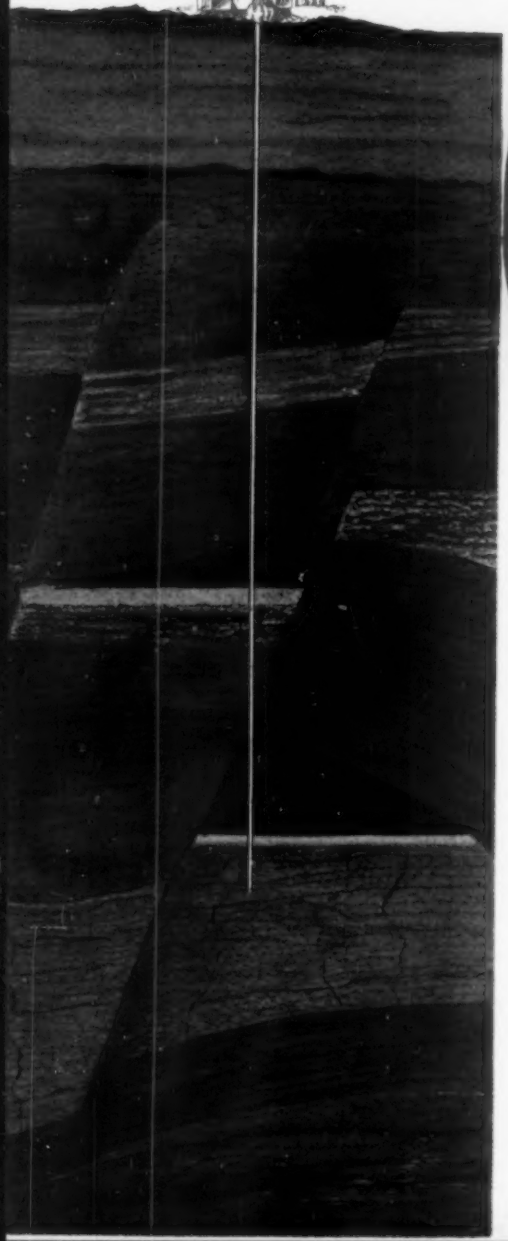
Three-Phase Metering Separator Available

283 Mid-Continent Supply Co. has designed a number of 3-phase metering separators featuring a provision for easy installation of a fire box, complete with controls, if and when heat is needed. With firebox, unit becomes a small metering treater for testing.

Oil and water are metered separately from lower compartmented area and adjustments are provided for measurement accuracy. Both oil and water metering systems are provided with a microswitch to electrically transmit measured quantities to a central recording station. *Mid-Continent Supply Company.*

What's Behind The Casing... is it OIL or WATER?

Your Answer...



PGAC's NEW SPECTRAL LOG

—a major break-through of the barrier to OIL DETECTION

For a long time you've heard others **talking** about oil field Spectrometry — while PGAC **perfected** it!

With new instruments of high sensitivity to Chlorine effect, PGAC's Spectral Log determines the *presence* or *absence* of Chlorine in formations. Since the absence of Chlorine in a possible producing horizon usually indicates the presence of oil — *and vice versa* — the running of a Spectral Log is obviously a profitable investment for every operator.

Actual Tests Proved...

PGAC's Spectral Log 80% EFFECTIVE

Write today for your copy of the detailed report on Spectral Log field tests.

PGAC-602

P G A C OIL FIELD SERVICES

Pan Geo Atlas Corp.

7730 Scott Street, Houston 21, Texas—Phone REpublic 4-1651 CHEMETRON

FORMERLY: PERFORATING GUNS ATLAS CORPORATION

PGAC'S SUBSIDIARY COMPANIES — CANADA — Perforating Guns of Canada, Ltd. VENEZUELA and BOLIVIA — Servicios Tecnicos Atlas, C.A. GERMANY — Atlas Deutsch-Amerikanische Ölfelddienst, G.m.b.H. U.S.A. — PGAC Development Company

When rig-up starts . . . a stock check-up starts here

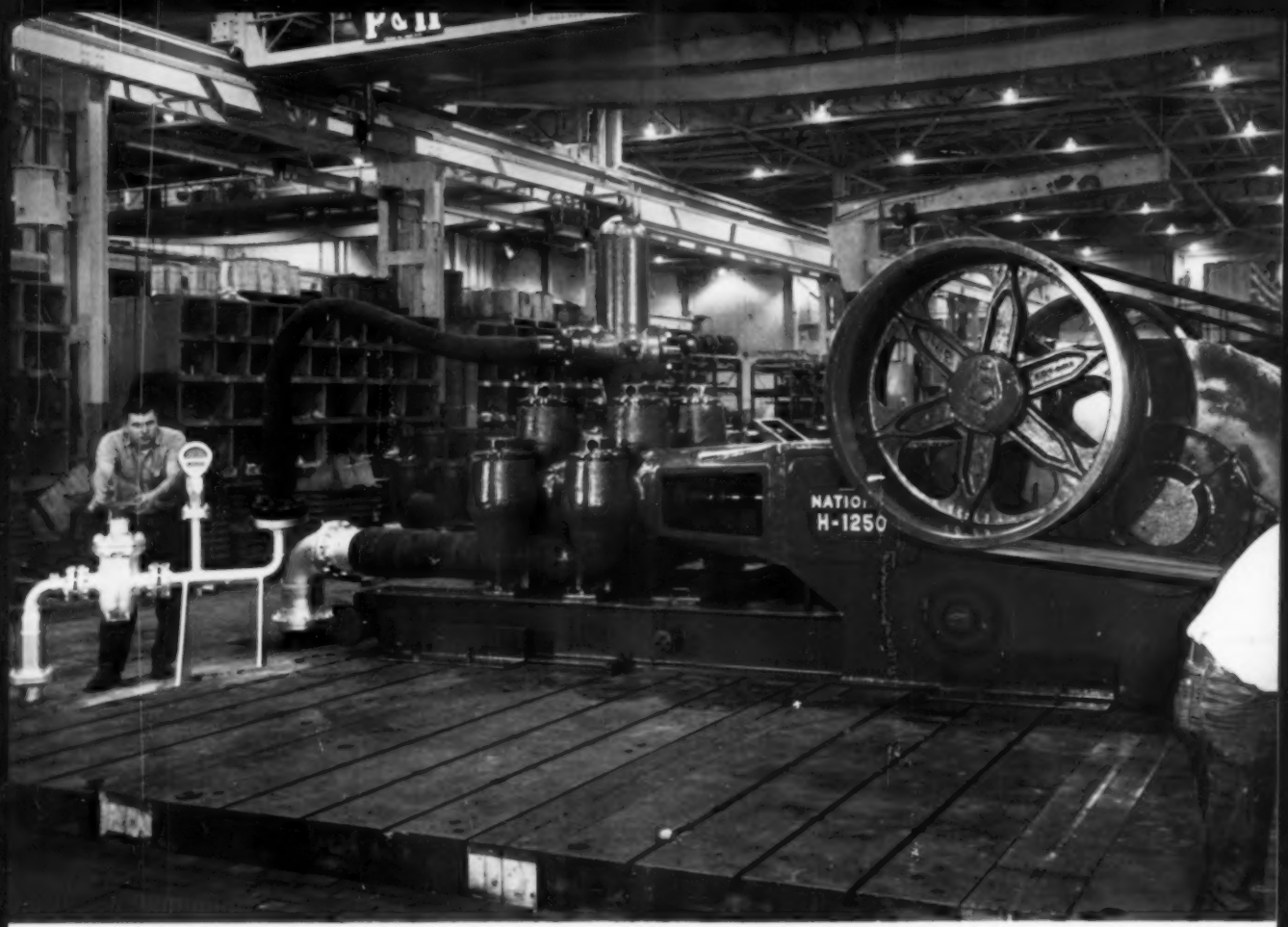
When you move a rig to a new location, folks in the nearest National Supply store go into action to *help you reduce down-time!*

This job calls for STOCKING vital parts that you might need in a rush . . . and DOING this job calls for a constant check of inventory to spot any gaps, and then ordering all items required.

This isn't all of the story, by any means. If any unanticipated breakage occurs, an immediate check is made with other stores in the district to find out where the necessary part can be obtained most quickly. Our nationwide teletype network lets us check availability with all 120 outlets.

The stocking of repair parts is only part of National Supply's store service. We purchase equipment and supplies from thousands of different sources—but all items have one thing in common. Every product we handle is trade-marked with the brand of established, reputable manufacturers, such as Byron Jackson, Chiksan, Ray-O-Vac and Clayton Mark.

Read about National Supply pump products on next pages

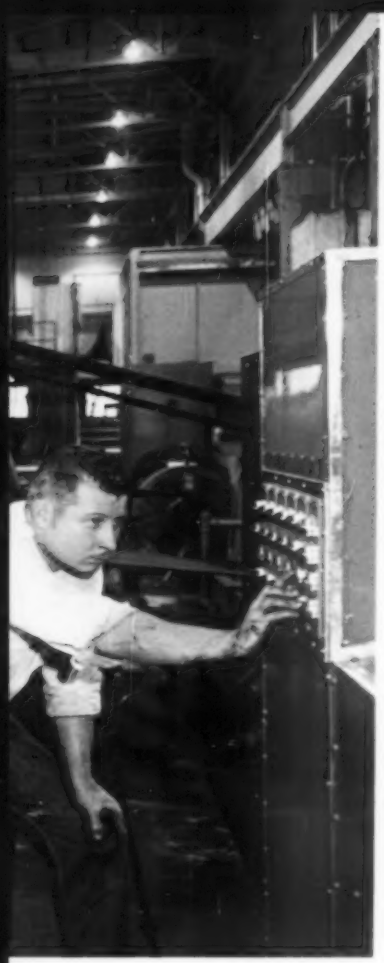


All National pumps are thoroughly inspected and tested before shipment. Photo shows new H-1250 pump undergoing extensive testing at National's Gainesville, Texas, pump test stand. This test stand is capable of transmitting up to 1400 input horsepower.

HOW TO REDUCE MUD SYSTEM

H-1250. National's engineers used new approach in designing power end frame for H-1250 slush pumps. Streamlined, strengthened box-type unit will withstand all pressures of severest service. Unique design features result in reduced cylinder bore wear, longer liner packing service, longer life for connecting rod and main bearings, fast and efficient lubrication.

K-500. This completely new 513 input horsepower slush pump provides a high degree of accessibility which simplifies and speeds up routine maintenance operations. "Fast change" screw type valve covers and threaded cylinder head arrangement permit rapid removal of all fluid end parts, without removing cylinder head body. Write for new Bulletin No. 500.



New National H-1250 Power Slush Pump combines high strength with light weight, compactness

Advanced design of National's H-1250 power slush pump meets all requirements of modern jet drilling. Yet all features retain the durability that is traditional in National Supply pumps.

Here are a few of the H-1250 features that pay off in long, trouble-free service:

LIGHT WEIGHT. Main frame is fabricated of formed steel plates, structurals and castings, welded in a tight unit with high structural rigidity. The H-1250 is very portable, due to light weight in relation to its 1,250 input horsepower.

LONG PACKING LIFE. Liner and cylinder head packing last longer . . . can be independently adjusted without disturbing metal-to-metal fluid cylinder liner arrangement. New dual cage fluid end design reduces cylinder bore stresses.

IMPROVED FATIGUE LIFE. Reduction in cylinder bore stresses is achieved as new design reduces by nearly one half the length of the bore exposed to fluid pressure.

It will pay you to investigate the many new features of National's H-1250 slush pump. Write for Bulletin No. 502, or call your nearest National Supply representative.

Steel

Steel's Symbol of strength, long life, and economy

National Fluid End Parts on next page

COSTS WITH NATIONAL PUMPS

K-700. This new National power slush pump is exceptionally light in weight for the 700 input horsepower rating. Design incorporates same fluid end innovations as the K-500. Fluid end is a one-piece steel casting with streamlined internal passages. Cylindrical sections give maximum strength. Each fluid end is given a thorough hydrostatic test before final assembly. Write for new Bulletin No. 501.

PULSATION DAMPENERS. The National Pulsation Dampener is made without troublesome rubber diaphragms, bags or sleeves. Only rubber element is an inexpensive valve disc that can be replaced in minutes. Rig air supply operates the dampener without need for high pressure air supply or nitrogen for pre-charging. National Pulsation Dampeners are available as original equipment or for field installation.

Careful packaging and shipment of National Fluid End parts assure delivery in factory-perfect condition.

National Fluid End Parts are readily available when and where you need them

National Supply has utilized its facilities and experience as a leading pump manufacturer to develop a complete line of fluid end parts for your use. Every part meets the most exacting quality standards.

DUAL SEAL PISTON

Incorporates two replaceable piston rubbers, forming an inner and outer seal at each end of the piston. Void between the rubbers allows space for displacement, minimizes damage to piston lips as it enters liner. Heavy fabric section molded into the back of inner rubber dams off extrusion around the OD of hub, and reduces pinching of the rubber. Forged steel hub of piston resists expansion under extreme loading.

FLUID PISTON ROD PACKING

Fluid pressure actuates the sealing lips. The greater the pressure, the tighter the seal . . . yet the solid make-up through the body of the packing minimizes the danger of overtightening it when it is installed. Rod wear is sharply reduced, because lip pressure is never excessive . . . in fact, it is negligible on the suction stroke.

FLUID CYLINDER LINERS

The ID of the Nationaloy Liner is case hardened throughout its length. Precision honing gives it maximum resistance to wear, washing and abrasion. Outside surface is machined to close tolerances, promoting closely controlled fits which reduce piston and rod wear due to misalignment.

FLUID CYLINDER LINER PACKING

Resistant to oil, gas heat and chemicals, National Liner Sleeves provide a perfect seal between the liner and pump bore. They are sufficiently hard to be confined in the packing space . . . preventing excessive flowing and pinching . . . yet they retain ample resiliency for proper sealing action.

"BLUE STRIPE" AND "BLUE CHROME" PISTON RODS WITH API TAPERS

Have maximum tensile strength and high resistance to impact. Precision ground and polished to reduce wear of both packing and rod. "Blue Chrome" Piston Rods have a super-hard, abrasion-resistant chrome finish which gives added packing and rod life under all conditions.

TYPE G-2 FLUID VALVES AND SEATS

Promote maximum pump efficiency, with maximum effective opening for fluid flow to permit complete filling at high speed. The lower guide . . . integral with the valve . . . has a large contact area which reduces wear and minimizes the possibility of cocking. A heavy clamp plate and lock gives longer valve life.

THE NATIONAL SUPPLY COMPANY

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by Remote Control . . . Time Cycle . . .
Liquid Level or Temperature Differential . . .
Radio Impulse . . . or by any Signal
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- TOP-GENERATOR MOUNTED PANELS
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- FLOOR PANELS
- AUTOMATIC START-STOP PANELS
- AUTOMATIC BATTERY CHARGING PANELS
- AUTOMATIC LOAD TRANSFER SWITCH PANELS

®Registered—ENGINATORS are built ONLY by Waukesha Motor Company, at Waukesha, Wisconsin, and Clinton, Iowa.

482

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS. / **New York • Tulsa • Los Angeles**
Factories: Waukesha, Wisconsin and Clinton, Iowa

Artificial Lift

Hydraulic Pump Handles Large Volumes

284 A new subsurface hydraulic pump with a high volumetric efficiency has recently been introduced by Kobe, Inc. for pumping large volumes at unusual depths. These fully-balanced, double-acting pumps are in service in the waterflood project in the Wilmington field, California, where a hydraulic pumping system averages 1200 bbl per day through 2½-in. tubing.

In the Boscan field, Venezuela, a 4-in. bottom-hole unit is pumping 1500 bbl per day of 10.5-gravity oil from an 8000-ft depth. In Colombia, 17 directionally-drilled wells bottomed underneath the Magdalena River are being pumped hydraulically. Oil is heavy (19-gravity) with an excessive sand condition. To date, all installations employing the new heavy-duty pumps report satisfactory service. *Kobe, Inc.*

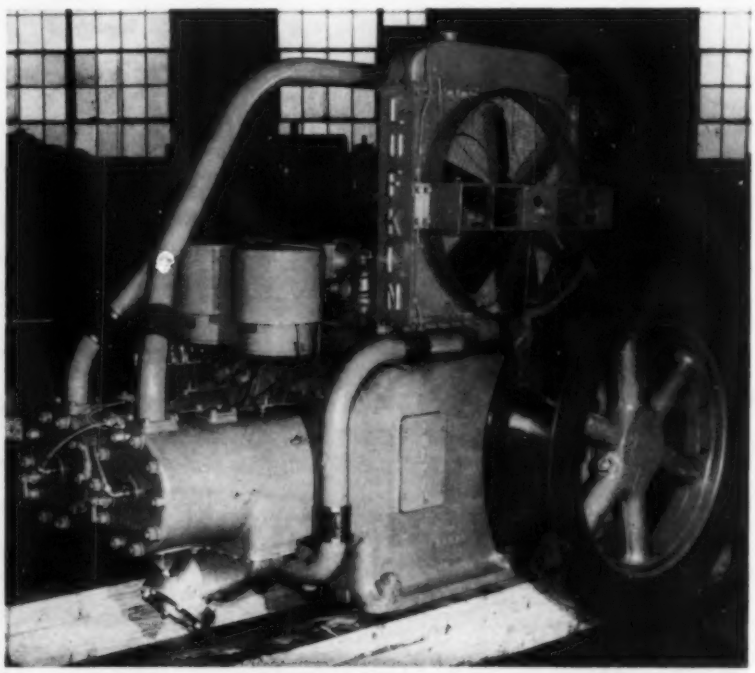
Pump Designed for High-GOR Wells

285 Axelson has completed testing of a new pump for producing high gas-oil ratio wells. The "Three-Stage" pump is highly successful in producing wells where gas lock may have prevented normal pump operation.

The principle of the pump is similar to that of the Axelson 2-stage pump with the exception of an additional compression chamber. The lower ⅔ of the pump contains the first and second stages. The third-stage addition offers several additional advantages: (1) a higher compression ratio is possible; (2) it provides a means of building in a good compression ratio at the bottom of the stroke for the important first and third stages; (3) compression can be controlled by selection of component part lengths so at the bottom of the stroke there is a minimum of volume in both first and third stages. In effect, the pump incorporates the same principles used in a 3-stage compressor. *Axelson Division of U. S. Industries, Inc.*

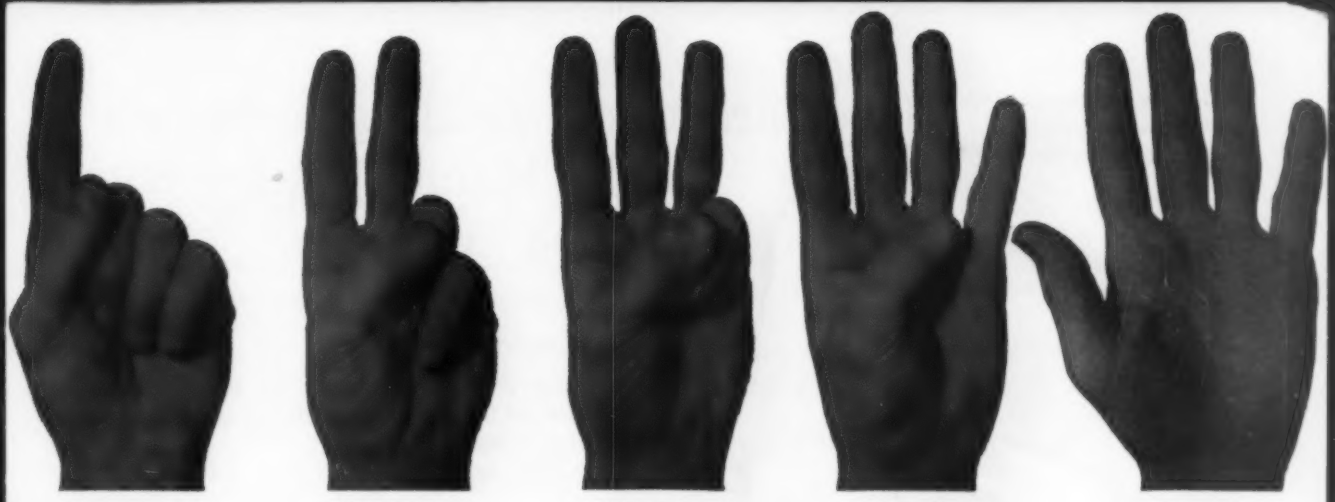
Subsurface Pump For Slimhole Completions

286 Newly-marketed line of subsurface pumps for slimhole wells with 1¼ or 1½-in. tubing is available to producers who have been hesitant about slimhole completions because of limited production equipment. These "Little Squirt" pumps were designed to provide operating advantages of small diameter tubing plus stamina and reliability of regular size units. They are available in 4 rod pump sizes, including hollow types, and 5 tubing pump sizes, with metal or cup plungers. A complete line of accessories is available, including seating nipples for rod pumps, chrome-plated plungers, and heat-treated barrel tubes. *Harbison-Fischer Manufacturing Company.*



Heavy Duty Gas Engines For Continuous Service

287 Two larger engines, one rated at 120 bhp and the other at 145 bhp, at 475 rpm and for continuous duty running, have been added to the Lufkin line for oilfield applications that include driving pumping units, waterflood injection pumps, gas compressors, and generators. Model H-1770 and H-2165, respectively, are of twin-cylinder, 2-cycle, horizontal design and use natural gas as a fuel. They are furnished as complete power units with built-in thermosyphon type cooling, full pressure lubrication, built-in safety controls, and with or without clutch for direct connecting or for V-belt driving various types of machinery. Oil cooled pistons are a refinement that can be supplied. Optional equipment includes electric starter, air-gas motor starter, high pressure air starting or friction wheel starting. *Lufkin Foundry & Machine Co.*



BETTER drilling rates in all types of muds: T-8, lime, gyp, and low pH, with varying amounts of oil.

BETTER (lower) barite requirements when substituted for oil in muds.

BETTER hole lubrication, in all types of muds, to reduce pipe sticking.

BETTER bit bearing life **even in high solids muds.**

BETTER geological interpretation and electrical logs; no fluorescence.

PLAN WITH BIT LUBE to drill 5 ways better . . .

WELL DONE WITH MAGCOBAR TECHNOLOGY . . . THROUGH PLANNED MUD PROGRAMS

MAGCOBAR PLANNED MUD PROGRAMS make the above statements facts, not claims. In high weight emulsion muds, for example, the Magcobar engineer properly substitutes Bit Lube® for some of the oil to cut drilling costs by reducing the amount of barite required. In a typical well, the oil content of the mud was allowed to drop from 11 to 5 per cent. Bit Lube was added to this 17.8 lb./gal. lime mud with these savings in barite:

	Sacks of barite per day	Cost of barite per day	Cost of Bit Lube per day	Cost of Oil per day	Total Cost per day
Emulsion (2 week average)	177	$409.76	$—0—	$74.03	$483.79
Bit Lube and Emulsion (3 week average)	52	120.38	122.43	8.25	251.06

NET DAILY SAVINGS WITH BIT LUBE: $232.73

Not only does Bit Lube give direct cost savings, but it also offers escape from costly pipe sticking, even in extreme directional holes. Bit Lube lowers the friction coefficient of the mud, to give over-all higher drilling mud performance. These savings can be added to those in the chart.

The skilled use of good products like Bit Lube to cut drilling costs is the heart of Magcobar Technology. Let the Magcobar engineer plan the mud program for your next well and this Technology will save for you all along the line.

WELL DONE WITH MAGCOBAR TECHNOLOGY . . . THROUGH PLANNED MUD PROGRAMS

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Complete
DRILLING MUD SERVICE

DRESSER INDUSTRIES, INC.
OIL • GAS • CHEMICAL
ELECTRONIC • INDUSTRIAL

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HOUSTON

ANOTHER HOMCO DIRECTIONAL DRILLING SUCCESS REPORT

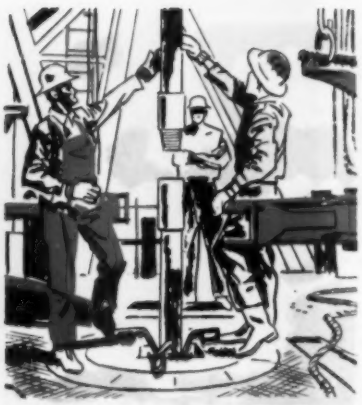
Two Directional Drilling problems where Homco equipment saved hours of rig time

Gulf Coast independent operator says:

"Homco's Mechanical Orienting Tool saved me eight hours and fifteen minutes wire line time on two settings below 14,000 feet."

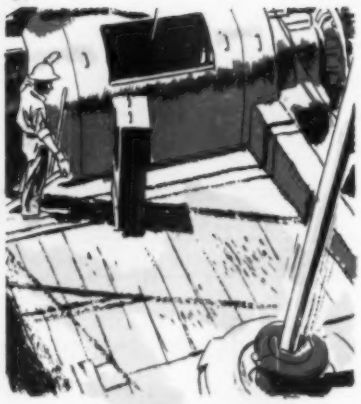
Terrebonne Parish, Louisiana

1. First whipstock was set at 14,363 feet with conventional BHO method and checked. Time required to orient tool was four and one-half hours. Second whipstock was set at 14,821 feet using a 6" O.D. Homco Mechanical Orienting Tool. Time required was thirty minutes. (Results were perfect.)



2. Third whipstock was set at 15,080 feet with the same Homco Mechanical Orienting Tool. Time required fifteen minutes. (Perfect results.)

3. The Homco Mechanical Orienting Tool saved more than four hours rig time each time it was used. It also eliminated the hazard of stuck pipe as the string can be actuated and circulation maintained. Abnormally high temperatures and extremely heavy muds have no effect on this tool.



Homco Mechanical Orienting Tool*

The HOMCO Mechanical Orienting Tool presents a new concept for orienting whipstocks and deflecting tools without the use of subsurface surveying instruments, which previously required two or more trips with a wire line to correctly orient the deflecting tool. The drill pipe is raised, rotated, and lowered until a ball falls into a slot which permits the tool to close and indicates that the deflecting tool is correctly oriented.

ADVANTAGES: Eliminates numerous trips into the hole with subsurface surveying instruments. Reduces orienting time to approximately twenty (20) minutes. Torque in drill string does not affect setting. Not affected by high temperature. Write for Technical Bulletin #51-1-1.

*Patent—U.S. Letters Patent No. 2,686,660

NEED THE ANSWER TO A DIRECTIONAL DRILLING PROBLEM?

HOMCO HAS IT!

HOMCO

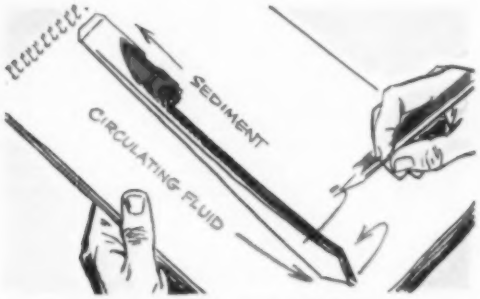
DIRECTIONAL DRILLING

California tool pusher says:

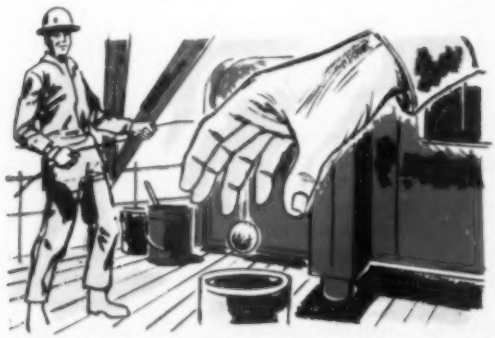
"Homco's Circulating and Releasing Whipstock is the only tool that circulates to the bottom of the hole and assures a firm setting for the whipstock."

"We've learned now that when we have to set a deflecting tool in the hardrock country, it saves time and money to have the Homco Circulating and Releasing Whipstock on hand. It has saved us rig time in West Texas, California, the Rockies, and Canada."

1. The HOMCO C&R Whipstock is installed on the drilling string and is lowered into the hole. There is no danger of shearing the pins. Should a bridge or fill be encountered, the whipstock is raised, circulation started, and the tool is rotated through the obstruction.



2. On reaching the bottom of the hole, circulation is commenced to wash any sediment or cuttings free which may impede the setting of the whipstock. Circulation and rotation are continued until the whipstock can be set firmly on the bottom of the hole. The whipstock can now be oriented in the correct direction by means of the HOMCO Mechanical Orienting Tool, or by other sub-surface orienting means.



3. After orientation, a ball is dropped into the drill pipe and pumped down to land in the ball seat on the upper end of the piston in the setting tool. The pumps apply pressure to the piston assembly until the pins between the upper shell and piston are sheared. The piston is forced downward permitting the shear balls to be forced from a position between the whipstock collar and lower shell into the setting tool. This diverts the circulation from the whipstock to the drill bit and disengages the setting tool from the clutch arrangement in the whipstock collar by lowering the drill string slightly. When disengagement is accomplished, rotation is commenced and a rathole is drilled in the conventional manner.

Homco Circulating and Releasing Whipstock*

In most directional drilling operations, a problem is the removal of sediment and cuttings that settle to the bottom of the hole after circulation ceases. This fill prevents the whipstock from reaching the bottom of the hole.

The HOMCO Circulating and Releasing Whipstock permits sediment to be circulated out of the hole before setting, eliminating mis-runs with whipstocks. The circulating fluid is channeled through the whipstock to the lowest point of the tool. While circulating, the HOMCO C&R Whipstock can be rotated without danger of shearing pins, assuring a firm seat.

ADVANTAGES: Eliminates danger of shearing pins while going into the hole. Whipstock can be rotated without danger of shearing pins. Circulation can be obtained at bottom of the tool where it is needed. Whipstock can be rotated and circulation maintained on bottom before setting, to assure a firm seat. Write for Technical Bulletin #94-7-1.

*Patent—U.S. Letters Patent No. 2,823,012

HOMCO

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Two-Zone Subsurface Pump Efficient and Flexible

288 Continental-Emsco has introduced a new 2-zone subsurface pump featuring standard operating efficiency plus the flexibility required in multi-zone completions. Patented valve, consisting of a drop and seat, enables the complete unit to be retrievable on the sucker rod string. Valve is attached just below upper-pump barrel, providing closest spacing possible for maximum compression on the down stroke. Sealing surfaces are of carbide material to provide maximum resistance against corrosion, sand, and fluid cutting.

By standardizing on the 2-zone pumps, the following operations are possible using a wireline retrievable choke: Flow both zones; pump either zone—flow the other; flow one zone—plug the other; completion and remedial work; test zones without disturbing tubing string. Types available: 2-packer; 1-packer with hollow sucker tubes; 1-packer parallel installations with either 2 or 3 tubing strings; triple completions, 2 or 3-packer. Two packer and one packer with hollow sucker rods come in 4½-in. to 7-in. OD casing sizes, others in 5½-in. to 7½-in. *Continental-Emsco.*

Downhole Pump Cannot Gas Lock

289 Elimination of the ball-and-seat traveling valve permits operation of a new downhole pump free from gas lock. The rod-actuated plunger pump, manufactured by Reynolds Oil Field Sales Company, features a valve-and-seat seal between a cylindrical plunger and a splined guide. On the upstroke, frictional drag between the sleeve and working barrel causes the sleeve to form a fluid-tight seal with the valve seat on the splined guide. Oil trapped inside the sleeve is then lifted. On the downstroke, friction unseats the sleeve, permitting oil to move upward through the assembly.

The unit is available in 1, 1¼, 1½, and 2-in. diameters. *Reynolds Oil Field Sales Company.*

New Line Of Crank Pumping Units

290 A new line of adjustable counterbalance crank pumping units is available from Cabot Shops, Inc. Units come with either Equalign or Equalastic equalizer bearings. Cabot's Equalign series is designed for equal torque factor geometry. Assembly contains a heavy-duty spherical roller bearing, allowing universal equalization at this point. Pin-end type pitmans are used on this series of units. Equalastic series feature bearing assembly at the equalizer. It employs heavy rubber bushing, which absorbs oscillating movement by torsional deflection of the rubber.

Adjustable counterbalance cranks permit counterweight adjustment through the use of large acme threaded screws. The adjuster screws are made of high-tensile aluminum to prevent rust.

Units in this series have hinge-back horseheads to permit sufficient well servicing clearance. Component parts of the units are designed to API specifications and feature standardization of parts. *Cabot Shops, Inc.*

New Sucker Rod Added to Line

291 The Axelson Division of U. S. Industries, Inc., has announced addition of the #72 sucker rod to their line. The new rod is being made to fill the requirements of the operator for a high-tensile, carbon steel sucker rod. It is made from chromium molybdenum alloy steel, normalized and temperized from end to end.

The #72 sucker rod has an average yield point of 110,000 psi and a tensile strength of an average of 130,000 psi. *Axelson Division of U. S. Industries, Inc.*

Oil Lubricated Plunger

292 Fluid Packed Pump Company's oil lubricated plunger is a new development in rod drawn pumps. It is designed for use with stationary barrel pumps — either tubing or insert type — to increase service life of both the barrel and the plunger in wells where water cut is high. The automatic lubricating system incorporated in the plunger assembly provides continuous separation of clean oil in an annular flotation chamber and permits this clean oil to slip past the plunger to form a continuous lubricating film.

Operation of the oil lubricated plunger is as follows: On each downstroke, a small quantity of fluid is diverted around the flow divider, into the annular passage, and back through return holes into the main flow in the center tube. On the upstroke no flow occurs, and oil remaining in the annular fluid passage rises and is trapped by its own buoyancy in the nonturbulent portion of the flotation chamber above the return holes. This operation repeats itself on each stroke of the pump, assuring a continued supply of oil to the chamber.

The oil lubricated plunger is available for use in pumps with bore of 1½, 1¾, 2, 2¼, 2½, 2¾, 3¼, and 3¾ in. *Fluid Packed Pump Company.*

Electrical Pump Motors

293 A new line of squirrel cage Life-Line A motors from 3-75 hp is available from Westinghouse. They are designed for outdoor oil field pumping service.

The motors provide top performance over a wide voltage range. Low magnetizing current assures high power factor even at overvoltage. High starting torque provides positive breakaway even on low voltage under severe loads and in icing conditions.

Both the stator and rotor are designed to handle short time overloads. The temperature rating is 10 deg C below the maximum values of industry accepted standards. *Westinghouse Electric Corporation.*

New Gas Lift Valve Stabilizer Controlled

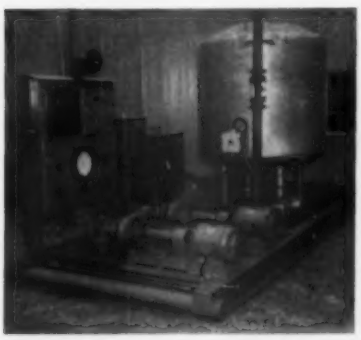
294 Now in production at Udell, Inc. is a new type gas lift valve which utilizes a dome and valve arrangement permitting dome pressures to be increased or decreased through manipulation of wellhead pressures. The system eliminates extensive and complicated calculations normally required since dome is charged with the same gas supply used in the gas lift operation and at same pressures and temperatures under which the valve will operate. As producing characteristics change during well life, dome pressure can be compensated without pulling tubing.

The valve is interchangeable and can be installed in existing landing subs or a modified version can be installed in standard tubing where there are no subs. Pressure on valve domes need not be reduced in descending order as with other valves. Operating pressure of bottom valve can be higher than conventionally pressure-charged gas lift valves. This results in greater latitude in valve spacing and the number of valves required to produce the optimum rates is less critical. *Udell Inc.*

Skid-Mounted Waterflood Unit

295 Bethlehem Supply Company is offering a completely portable, skid-mounted waterflood unit as a 1 or 2-piece package. The 1-piece package houses the filtration and control system, the second piece of the 2-piece package being a skid-mounted injection pump.

The unit is built to stay within highway limitations for ease of shipping. It can be furnished with maximum corrosion resistance. Completely automatic, including automatic backwash, the unit can be set in operation and left alone except for ordinary upkeep. Installation requires a minimum of site preparation—hook up to tankage, run main power source in, and flip the switch. Designed and fabricated to individual requirements, present designs are available to handle up to 4300 bbl per day. *Bethlehem Supply Company.*

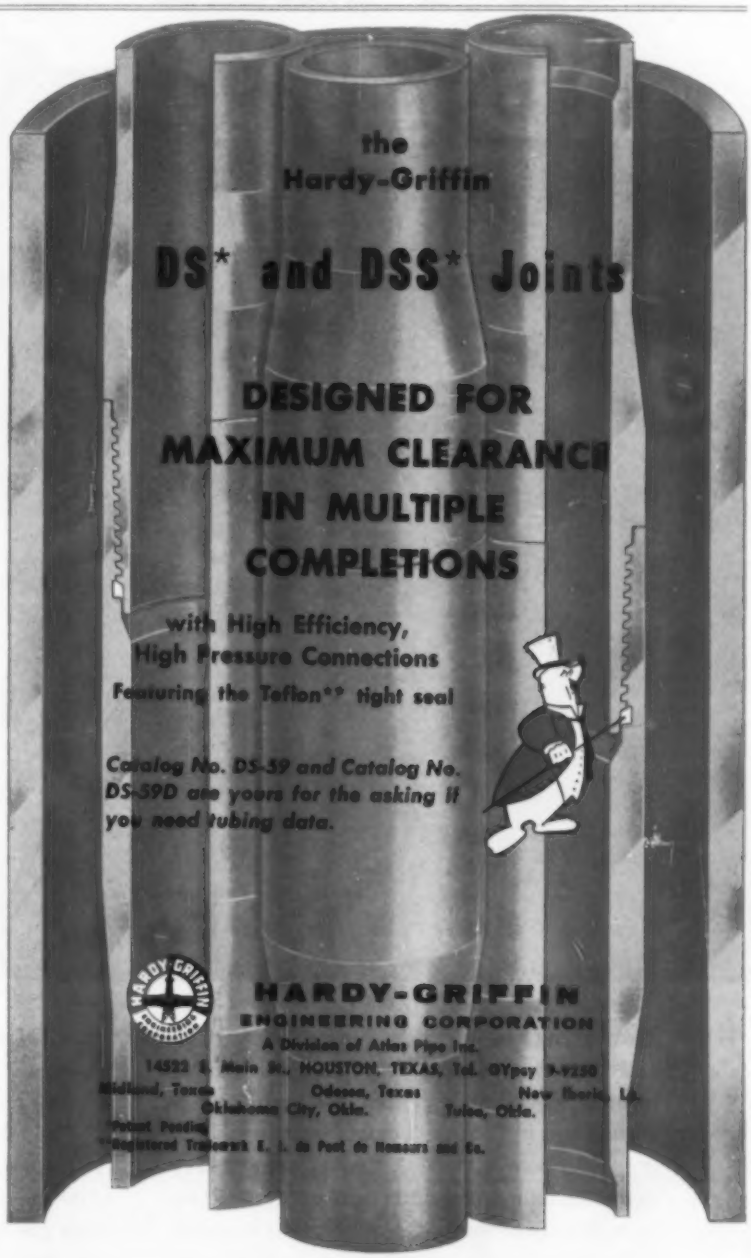


Triplex Pump Designated For Waterflood Operations

296 An 8-in. stroke plunger pump designed for big volume, high pressure capabilities needed in larger waterfloods has been added by Oil Well Supply. The horizontal, 3-cylinder, single-acting pump has an aluminum bronze fluid end that will take plungers from 3¼ to 4¼ in. in diam. Range at 266 input hp and 200 rpm is 5890 to 10,050 bbl daily at pressures of 2410 to 1400 psi.

Fluid ends are equipped with plate type nylon or stainless steel valve service, removable stuffing boxes and double suction and discharge connections. Plunger assemblies consist of CO-Hard, ceramic, or hardened steel plungers rigidly connected to allow steel shanks.

Power end is rigid, rib-reinforced structure with built-in single-helical reduction gear. Crankshaft and pinion shaft are mounted on shim-adjustable tapered roller bearings. Pinion shaft is reversible, enabling spacing multi-unit installations. All moving parts are adequately oiled by splash-flood system. *Oil Well Supply Division, United States Steel Corporation.*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DESIGNED FOR MAXIMUM CLEARANCE IN MULTIPLE COMPLETIONS
with High Efficiency, High Pressure Connections
Featuring the Teflon** tight seal
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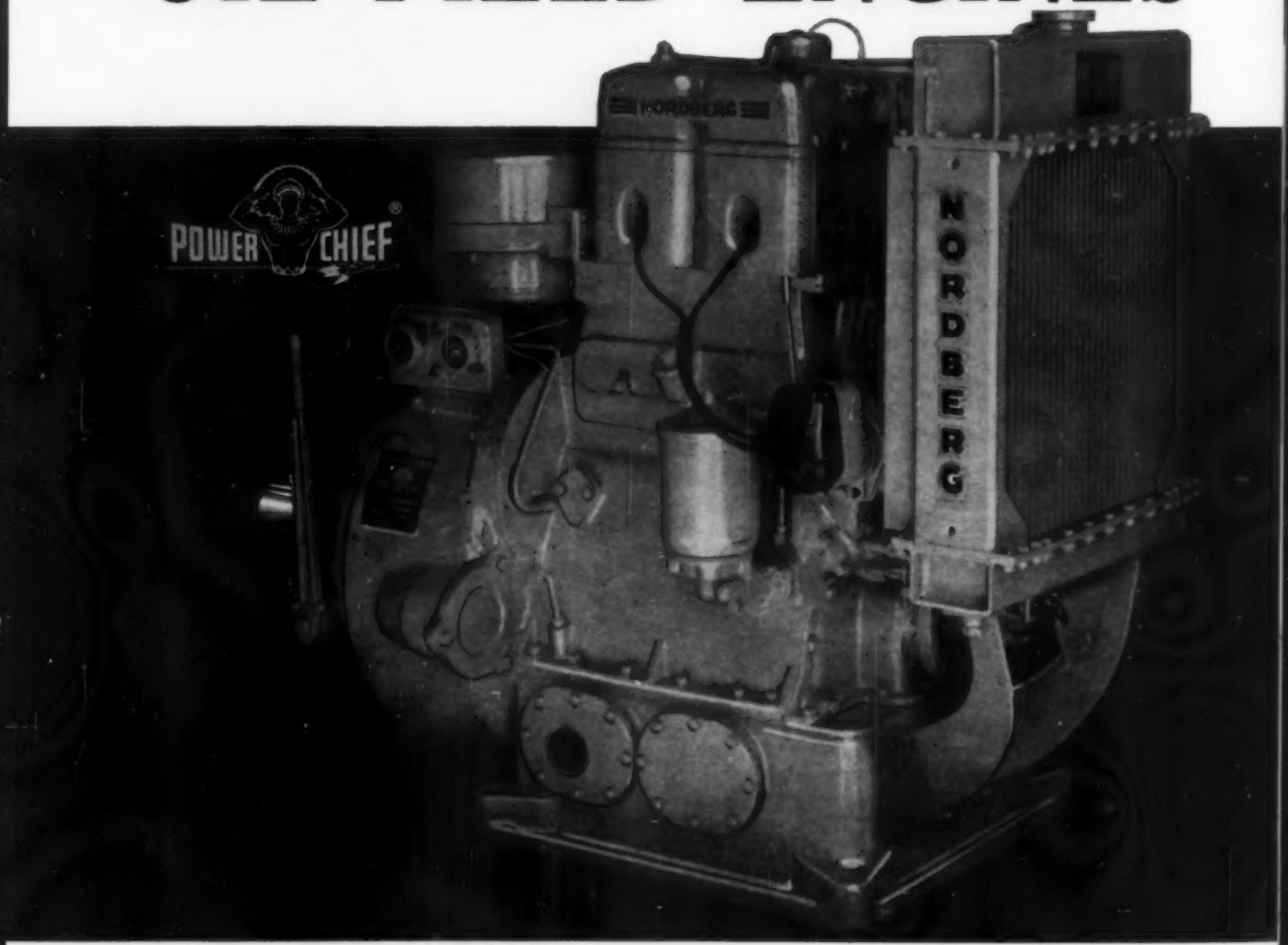
POWER CHIEF®
OIL FIELD ENGINES



Throughout the oil fields, Power Chief Diesel and Gas Engines are consistently achieving records for reliability and low maintenance costs. Built in 1, 2 and 3-cylinder sizes, all having 4½" bore and 5½" stroke, these heavy duty, medium speed units develop up to 54 hp max. Here are some of their important features:

Smooth, steady operation—heavy flywheel eliminates surging during pumping stroke . . . More safety features—including enclosed flywheel, enclosed clutch, enclosed fan, magneto impulse coupling eliminates starting kickback . . . Full pressure lubrication throughout engine . . . Lube oil heat exchanger eliminates sludging of oil in crankcase . . . Can be easily converted from gas to diesel operation . . . No extras to buy, engine comes complete with clutch and safety shutdown controls . . . Easy to service.

for production pumping and water flooding...

It will pay you to consider that actual Power Chief case histories show over 43,000 hours of continuous pumping operation—*with original rings, pistons, liners, bearings and crankshaft still in place!*

Here, then, is positive proof that Power Chief oil field engines, in sizes to 54 hp. really deliver the kind of rugged, day-in, day-out power you need for dependable production pumping and water flooding service at the very lowest maintenance cost.

for rig lighting...

Power Chief Diesel Electric Generator Sets are turning night into day for 24-hour drilling operations . . . as more and more drillers discover that these sturdy units can stand the gaff of continuous service, night after night, without constant attention and maintenance.

Built in 1, 2 and 3-cylinder sizes, Power Chief Diesels develop from 10 to 45 hp, 5 to 30 kw, in all standard AC and DC voltages . . . and all available with special vibration-proof mounting for rig installation.

for micro-wave communications...

Nordberg Power Chief Diesel generating units are being used to provide low cost, dependable power for both stand-by and main power source in micro-wave pipe line radio communication systems. And remember . . . these compact, rugged units are backed by the same reputation for dependability as the larger Nordberg engines used across the nation for low cost pipe line pumping service.

NORDBERG MANUFACTURING COMPANY
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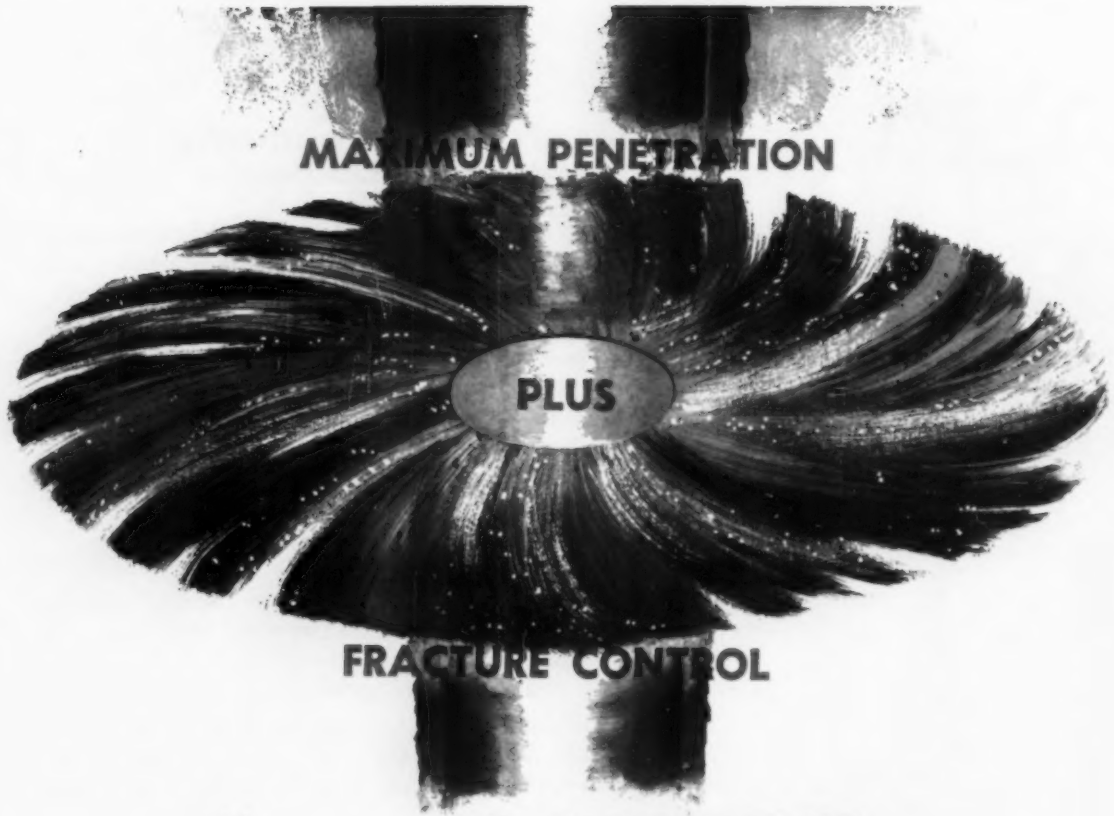
PC160



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Hydraulic Perforating Process

- Superior single-point entry for effective treatment and production
- Greatest possible penetration into the formation
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- Fracture Initiation or Under-Reaming patterns

Single-point entry utilizing Sandril hydraulic perforating process is daily reaping bonus benefits for operators throughout the Southwest. Sandril Fracture Initiation and Under-Reaming patterns employ single-point entry and attain maximum penetration into the formation on a horizontal plane.

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SERVICE DISTRICTS THROUGHOUT THE SOUTHWEST

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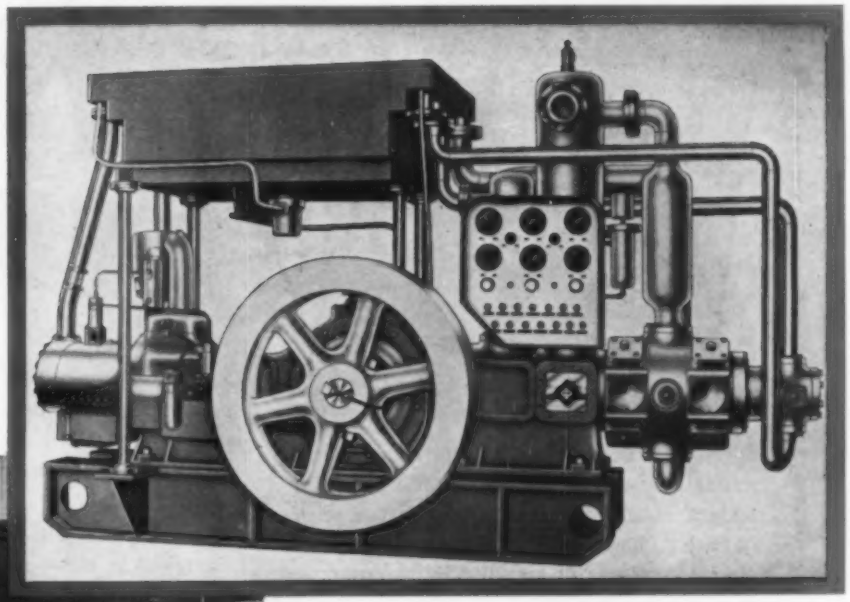
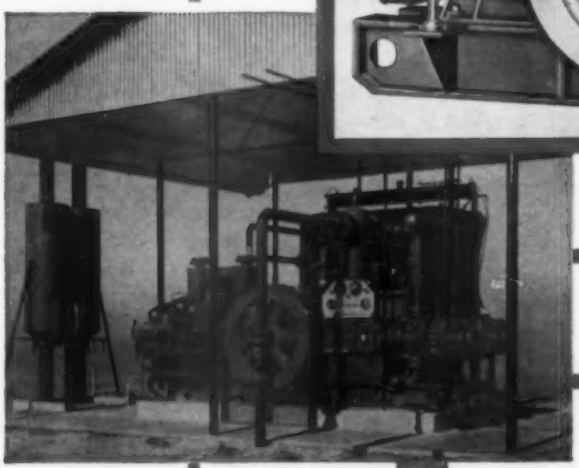


Shown above — the new DPC-60
Single Cylinder Engine-Compressor



DPC-230 Twin-Engine Compressor

There is enough gamble involved in the oil business without carrying it into the producing equipment phase.

Ajax equipment — engines - pumps - compressors — have proven themselves through the years.

Dependable — economical — and backed with conscientious service.

You may pay a little more simply because they are worth more.

Always a full dollars value in an Ajax product — always.

AJAX

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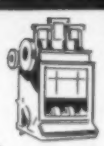
AJAX COMPRESSORS



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Oil Field Distributors

- The National Supply Co. — Pittsburgh, Pennsylvania
- Bethlehem Steel Co. — Supply Division, Tulsa, Oklahoma
- Mid-Continent Supply Co. — Fort Worth, Texas

DODGE HAS MORE PROVED BEARINGS THAN YOU HAVE BEARING PROBLEMS!

It pays to buy from a line of stock bearings—bearings that have been proved in thousands of installations similar to yours. You benefit by getting known dependability; and you get the important savings of high quality at production price.

PIN-POINT SELECTIVITY

Dodge has supplied mounted bearings to industry for over three-quarters of a century. Dodge bearings have always kept pace with improved production practices. Each new condition of service has been met by Dodge as it has arisen, with the result that the Dodge line contains mounted bearings to meet almost every service requirement with pin-point accuracy.

High load, high speed, excessive dust, moisture, corrosion, high or low temperatures, continuous operation—you name it!—such conditions and their combinations are met every day with Dodge bearings.

BROAD LINE—WIDELY DISTRIBUTED

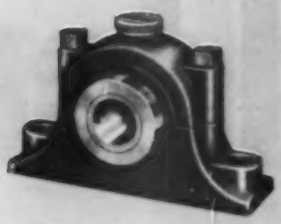
In the great variety of mounted bearings developed by Dodge, you will most likely find the precise unit to fit your requirements ideally—without paying for features you do not need. And if your requirements call for several types of bearings, there is an advantage in having them of common design, such as Dodge offers.

The Dodge line is probably broader than any other line of mounted bearings in America. And of special importance to machinery manufacturers, it is the most widely distributed line. There is always a Dodge bearing of the right type and size near at hand.

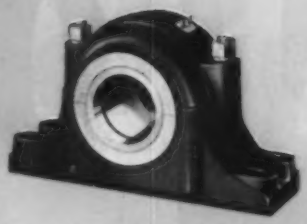
You can check this with your local Dodge Distributor. Ask him—or write us for the Dodge Bearing Bulletin.

In addition to tapered roller, spherical roller and ball bearings, Dodge builds many types of sleeve bearings. Here is the "large and small" of the sleeve type bearings carried in stock—ranging from an 8-in. Sleevoil weighing over 1200 lbs. to a ½-in. solid journal bearing weighing 9 ounces.

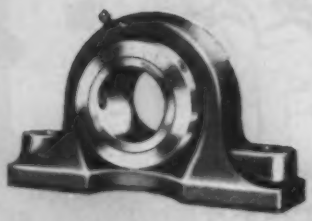
DODGE MANUFACTURING CORPORATION, 7900 Union Street, Mishawaka, Indiana



DODGE PILLOW BLOCKS WITH TIMKEN TAPERED ROLLER BEARINGS



DODGE SPHER-ALIGN PILLOW BLOCKS WITH SPHERICAL ROLLER BEARINGS

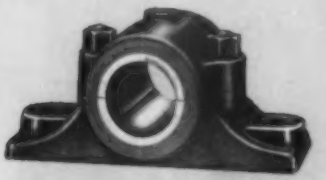


DODGE BALL BEARING PILLOW BLOCKS

DODGE SLEEVOIL PILLOW BLOCKS

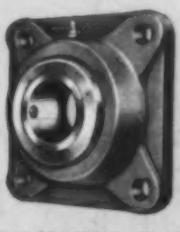
DODGE BRONZOIL PILLOW BLOCKS

DODGE BRONZE BUSHED PILLOW BLOCKS



DODGE JOURNAL BEARINGS SOLID AND SPLIT

DODGE HEAVY RIGID PILLOW BLOCKS



FLANGE BEARINGS: HANGER BEARINGS: BEARING UNITS: TAKE-UPS

● **Dodge Pillow Blocks with Timken Tapered Roller Bearings.** America's quality pillow blocks. Assembled, lubricated, adjusted and sealed at the factory. 5 types for varying needs.

● **Dodge Spher-Align with Spherical Roller Bearings.** Rugged heavy duty, compact, inherently self-aligning. Exclusive Micro-Mount simplifies installation.

● **Dodge Ball Bearing Pillow Blocks.** Deep groove ball bearings with long inner races—high capacity. SL, SC and SCM models for light, normal and medium service respectively.

● **Dodge Sleevoil Pillow Blocks.** Ultra quality . . . extra long life . . . accessibility . . . *quiet*. Plain or water-cooled.

● **Dodge Bronzoil Pillow Blocks.** Efficient, low cost pillow blocks with self-oiling, capillary bronze bushings. Self-aligning. Large oil reservoirs.

● **Dodge Bronze Bushed Pillow Blocks.** Quiet fan and blower pillow blocks with two bronze bushings of high lead content mounted in one cast iron housing.

● **Dodge Journal Bearings — Solid and Split.** True running, dependable. Babbitted bearings with precision machined bores and faces. Finished bases.

● **Dodge Heavy Rigid Pillow Blocks.** Rugged, carefully bored, babbitted pillow blocks for many applications requiring grease lubrication. Finished bases and ends.

● **Bearing Units.** A wide variety—spherical seat, cartridge, flange, hanger, screw conveyor hanger, take-up. Ball, Roller and Sleeve types.

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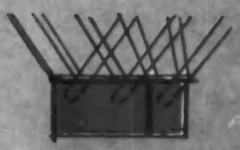
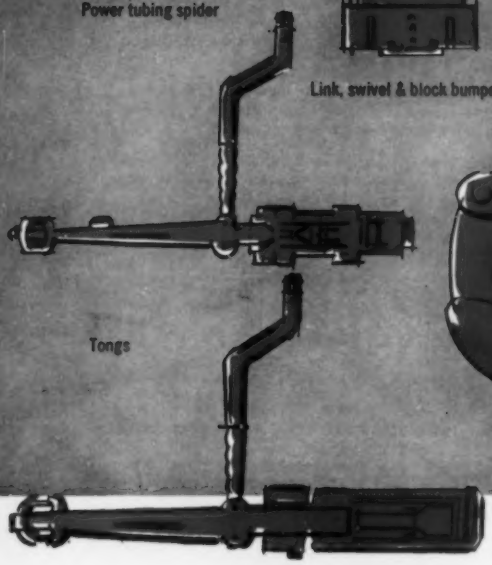
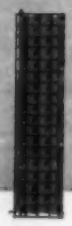


Scratchers



Tongs



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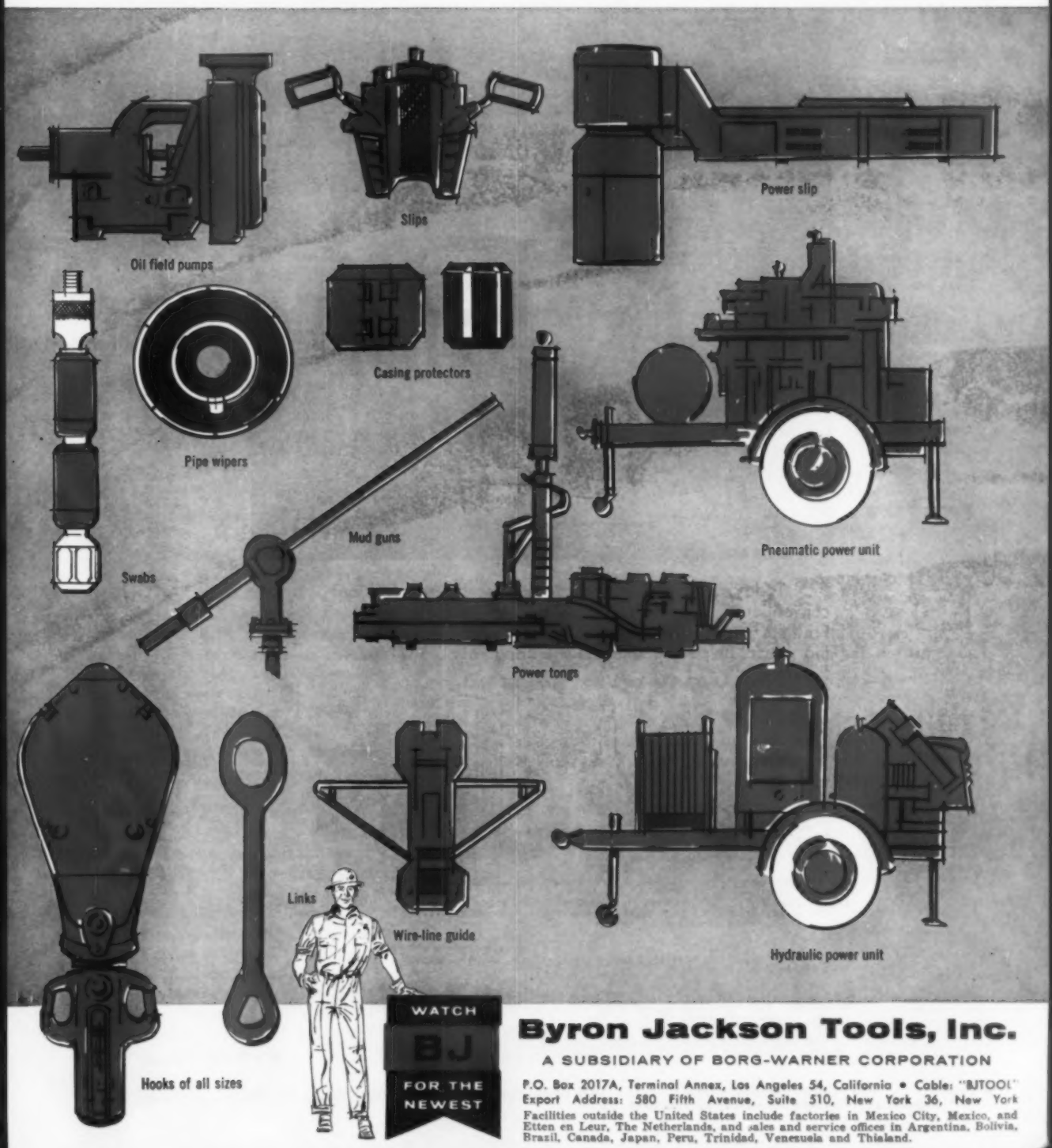

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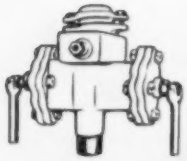
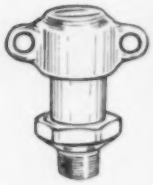
THE MOST IMPORTANT PART OF OUR EQUIPMENT ISN'T SHOWN!

It's the S·B·C field rep and his on-the-spot service

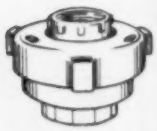
You can count on Skinner Brothers not only for the most efficient in modern equipment, but also for dependable 'round-the-clock service to help keep your operations humming at full speed. This reputation for *follow-through* has been built up through nearly half a century of service to the oil patch.



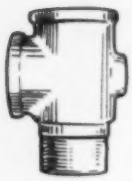
SINGLE PACKED STUFFING BOXES



JACK STUFFING BOXES

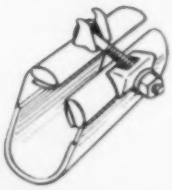


CROWN WOBBLERS



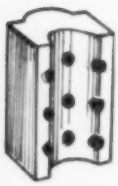
PUMPING TEES

Today, the S·B·C trademark is a symbol of superiority in both conventional equipment and in the new techniques which Skinner Brothers engineers are bringing to the industry. Have a problem requiring special help? A phone call will bring your S·B·C representative on the run.



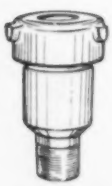
PAL MAR PIPE REPAIR CLAMPS

SINGLE AND DUAL FLEXI-POWER PIPEWIPERS

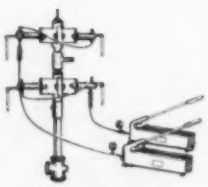


STUFFING BOX RUBBERS

CROWN RINGS

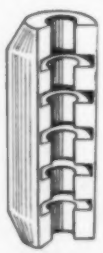


SUCKER ROD STRIPPERS



CONVENTIONAL AND HYDRAULIC SAND LINE AND DRILLING LINE OIL SAVERS

SWABS AND RED STREAK SWAB RUBBERS



BLOCK TYPE OIL SAVER RUBBERS

FLOW AND SUCTION STABILIZERS

LUBRICATOR ELIMINATORS

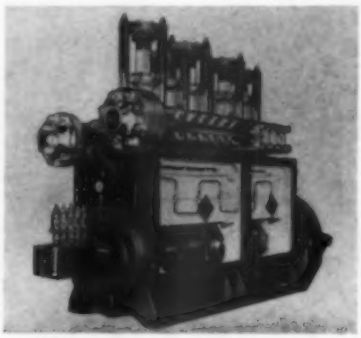
SKINNER BROTHERS COMPANY

BOX 628, TULSA

BOX 13556, DALLAS

New Quintuplex Pump For Secondary Recovery

297 Designed primarily for secondary-recovery operations is a new quintuplex pump offered by Ajax Iron Works. Unit has 5-in. stroke with plungers ranging in diameter from 1½ in. to 3¾ in. for continuous service



where high pressures are met. Input horsepower is rated at 230 bhp at 360 rpm; capacity is rated up to 14,700 bbl daily of fluid at 825 psi; pressure rating extends to 5150 psi. Designated QPA-5000 Series, the unit may be used to pump oil, low-pressure gas, and other fluids. *Ajax Iron Works.*

Diatomaceous Earth Water Filter System

298 The Silverstream filter manufactured by Infilco, Inc., consists of a vertical pressure vessel surrounding a number of vertical tubular elements, designed to expose optimum surface area for filtration through diatomaceous earth. The filter elements employ rigid cylinders of perforated metal to support flexible non-metallic surfaces of closely woven plastic which retain renewable coatings of commercial filter-aids. The actual filtration occurs through the coating of diatomite, so the degree of solids removal and length of runs are variable according to choice of filter-aid.

Liquid to be filtered is applied to the outside of the multiple elements under sufficient pressure to penetrate the filter-aid coating. Filter is cleaned by simply reversing the normal flow through the elements for a minute or two which washes the dirty cake out to waste. The elements are then recoated by introducing fresh filter-aid through a charging funnel or with the influent water, and the filter is restored to service. *Infilco, Inc.*

Its mirror-smooth interior walls enable KRALOY PVC PIPE to deliver 20% greater volume.

STOP SOUR CRUDE CORROSION, SCALING, PARAFFIN BUILDUP WITH KRALOY PVC PLASTIC PIPE

Sour crude troubles and tough oil piping problems are today being handled quickly, easily and economically by intelligent application of corrosion-proof KRALOY PVC PLASTIC PIPE. Moisture, rust, rot and gunk don't faze KRALOY. In gathering lines and salt water disposal lines, for example, oil operators and engineers find that KRALOY's unique qualities handle the job as no pipe of other material can. Amazingly light (⅛ the weight of steel), KRALOY'S high impact rating and flexural strength simplify transportation, handling and laying. Add the ease of cutting and joining KRALOY, you can then save up to 50% in installation costs!

Immune to electrolytic action and sulfate chemicals, KRALOY defies iron oxide salt deposits, resists scaling and paraffin buildup. Inert, corrosion-proof, it remains impervious to soil and most common acids—*never needs painting or cathodic protection*—cuts repairs and maintenance costs to the absolute minimum. Precision extruded, with mirror-smooth walls for maximum line-flow, KRALOY delivers up to 20% greater volume than same-size pipe of other material. Continuous rigid laboratory control insures unchanging KRALOY quality and long life of service. Available in all sizes from ¼" to 12" with plastic valves and fittings; also as U/L listed* electrical conduit in sizes ½" to 6".

*For direct underground burial, or encased in concrete.

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General Offices: Houston, Texas

Organic Sulfur Bactericides

299 A new type of product for chemical water treatment to control bacteria and the resulting corrosion and plugging problems in waterflood operations is being offered by Buckman Laboratories, Inc. Organic sulfur products, they are relatively non-adsorptive, completely soluble in water, and are insoluble in oil. They remain in the water phase of the oil-water emulsion and kill bacteria instead of merely inactivating them. The products are known as Busan 881 and Busan 901.

Benefits from the use of the organic sulfur compounds include a gradual cleaning of injection lines, practical elimination of iron sulfide sediment produced by sulfate-reducing bacteria, improvement in injection water quality, and improved filter operation. *Buckman Laboratories, Inc.*

Triplex Plunger Pumps

300 The Gardner-Denver Company is offering 2 new pumps for waterflood and salt-water disposal service. The models are the PQ and PS triplex waterflood pumps. The pumps are designed for secondary recovery service to give full capacities in continuous service.

Design features include aluminum-bronze wing guided valves and direct drive through double extended crankshaft. They also feature 1-piece aluminum-bronze fluid cylinder, removable stuffing boxes, insert type connecting rod assemblies, and full splash lubrication.

The PQ-2 maximum plunger size is 2¼ in. Plunger load is 1680 lb and bare pump weight is 570 lb. The PS-25 triplex maximum plunger size is 2¾ in., having a plunger load of 2960 lb. Weight of the bare pump is 720 lb. *Gardner-Denver Company.*

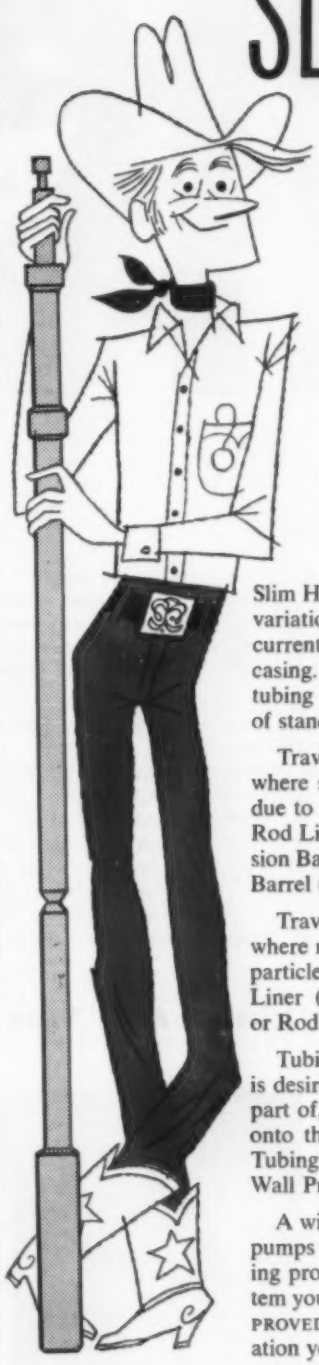
Water Flood Meter

301 A high pressure water meter, designed for use where oil is produced by water flooding, has been introduced by Rockwell.

Operating on the nutating disc principle of positive liquid displacement, the new Model 504 "Five Pointer" has a maximum capacity of 20 gpm or 30 bph.

The meter is pressure rated at 2000 psi and pressure tested to 4000 psi for rugged performance in measuring water consumed at each flooding point. It has 1¼ in. straight male threads with swivel connections for ½-in., ¾-in., or 1-in. standard pipe.

The unit of registration is a straight reading, non-reset register in gal or bbl with a totalizer capacity of 5 digits. *Rockwell Manufacturing Company.*



SLIM HOLE PUMPS

"Well-proved"

Slim Hole Completions are essentially scaled down variations of conventionally sized well bores. A current trend being the use of 2⅞" O. D. tubing as casing. A pump for these completions where small tubing is used is necessarily a scaled down version of standard A.P.I. type pumps.

Traveling Barrel Rod Pumps for installations where sand or solid particles cause pump to drag due to wedging. These pumps can be furnished as Rod Liner Traveling Barrel (R. L. T.), Rod Precision Barrel (R.W.T.) or Rod Heavy Wall Precision Barrel (R.H.T.).

Traveling Plunger Rod Pumps for installations where no difficulty is encountered by sand or solid particle. These pumps can be furnished as Rod Liner (R.L.B.), Rod Precision Barrel (R.W.B.) or Rod Heavy Wall Precision Barrel (R.H.B.).

Tubing pumps are used where maximum volume is desired. The barrel screws onto, and becomes a part of, the tubing string while the plunger screws onto the rods. These pumps can be furnished as Tubing Liner Pumps (T.L.E.) or Tubing Heavy Wall Precision Barrels (T.H.E.).

A wide variety of materials is available for these pumps to provide combinations to meet all producing problems. Regardless of the rod pumping system you should choose, installations of these WELL PROVED PUMPS will give you the trouble-free operation you desire.

WRITE FOR BULLETIN 206

DW-20

PACIFIC DRESSER INDUSTRIES INC.

OIL • GAS • CHEMICAL ELECTRONIC • INDUSTRIAL

PACIFIC PUMPS

Inc... A Division of Dresser Industries, Inc.

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Pacific Pumps of Canada, Ltd.,
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UNION

More and more purchasing agents are employing a new concept in buying called value analysis. In it the integrity of the seller weighs heavily since it assures maintenance of uniformly high product quality.

Advanced procedures and equipment in Union's foremost laboratory enable our technicians to determine the life expectancy of wire ropes. Much of the time of our engineers is spent in the field checking to see that Union wire ropes live up to or exceed predetermined life expectancy rating under varying operating conditions.

In living with wire ropes and slings from the cradle to the grave, our engineers found new constructions were necessary. On many of the tougher jobs the life expectancy of standard wire ropes of the highest quality was too short.

In the oil industry this was the situation until after Union engineers spent months in the oil fields and laboratory developing a special construction tailored to meet the tough load and wear conditions imposed by rotary rigs. For many years ultimate low cost Tuffy rotary lines have helped battle the rising cost of drilling deeper wells, including the world's deepest.

Tuffy Rotary Lines Are Ton-Mile Engineered

Tuffy Standard Rotary Line is "ton-mile" engineered for standard rotary rigs and for large jackknife rotary rigs. Tuffy Jackknife Rotary Line is for smaller jackknife rigs drilling to depth of 6,000 feet.

Ultimate Low Cost Wire Ropes For Well Servicing

For a third century Union wire ropes have demonstrated the longer service life that makes them the ultimate low cost wire ropes in oil well servicing. There are Union standard constructions of rod and tube pulling lines, rod hanger line, cable tool drilling and casing lines, sand and pump lines and winch lines.

Wire ropes travel hundreds of ton-miles on rotary oil drilling rigs lifting and lowering drill pipe and tools out of and into the hole. On the world's deepest oil well Tuffy Rotary Line handled the longest string of well casing ever run. The final live load totaled 700,000 lbs.

Quickly Available... Around the oil world leading oil field supply stores make the ultimate low cost Union Standard Wire Ropes and Tuffy Rotary Lines quickly available.

Ton-Mile Indicator Free

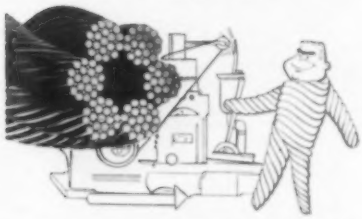
It's quick and easy to figure ton-miles of service with this slide rule chart. Designed for use in following cut-off practice originally developed by Union engineers. Write Union Wire Rope Corporation, 2106 Manchester Ave., Kansas City 26, Missouri.

3-O

Tuffy. Wire Rope Tips

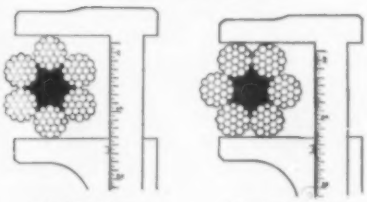
Money-Saving Information on the Use and Care of Wire Rope

Wire Rope is a "Machine" of Moving Parts



...and every part must fight destructive forces! A "look inside" a section of wire rope reveals a precision assembly of working parts. They are subjected not only to external and internal stresses, but also to heavy surface pressures and abrading. All these forces may be sustained while the rope is running at high speeds, and abruptly changing direction. That's why different uses require different constructions of wire rope.

How to Measure Rope Diameter



Right Way *Wrong Way*

There's only one right way: Use machinist's calipers, and be sure to measure the widest diameter. A slight shift of the rope in the calipers (shown at right above) might cause ordering an undersize rope.

How to Measure Tread Diameter

Easy, and important. Select the smallest sheave or drum to be used with the new wire rope, and measure actual diameter at lateral center (shortest dimension) of tread.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, 2106 Manchester Ave., Kansas City 26, Missouri.

UNION Wire Rope

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

USI Axelson PUMPING NEWS

Rising Costs Increase Use of On-or-Off Attachment

Saves Stripping Jobs. For over 20 years operators have been using the Axelson On-or-Off attachment as a safety joint to protect the rod string investment in sandy wells. It is impossible to estimate how many stripping jobs this attachment has prevented, or how many tens of thousands of dollars it has saved producers over that period of time.

After Sand-Fracing. In many sections of the oil country, it has become standard practice to install the On-or-Off attachment whenever a pump is run after a sand-frac job, because of the severe sanding up which may occur.

Reports from the field give many other uses of the On-or-Off attachment. For example:

Two-Zone Pumping. In West Texas the attachment is being used on practically every two-zone pump installation. Its use allows the pump to be run on the tubing, as a safety factor. It also insures proper spacing and seating of the pump.

Running Insert Pump. The On-or-Off tool is frequently employed when running a long insert pump through tubing to guard against the possibility of a stripping job if the pump becomes stuck in a tight spot.

High Water Cut Wells. Another cost-cutting application of the On-or-Off attachment is in wells where increasing water encroachment compels greater fluid lift for economical production. With the attachment, larger bore pumps can be used without going to larger size tubing or having to run the rods and tubing together. For instance, a 2½" TL pump can be used on 2" tubing, or a 4" pump on 2½" tubing. In the same type of application, the On-or-Off attachment can be used with a casing pump.

Easier Paraffin Removal. Wells with moderate paraffin conditions often handle the problem by installing paraffin knives or a series of scrapers above the On-or-Off attachment. This allows the rod string to be released, paraffin removed and the string re-set, all without unseating the pump.

Ask your Axelson representative to show you how the exclusive positive load action of the On-or-Off attachment keeps the threads shouldered at all times for positive seal. The attachment also has a self-centering action. Only ¼ turn rotation is needed to release, and both engagement and disengagement are positive. When engaged, the unit is as solid as a one-piece coupling, and foreign matter cannot enter.

How to Select the Proper Polished Rod

The one right polished rod for any pumping job is the one which best combines required strength and wearing qualities at lowest cost. Since no single material can do this under all conditions, Axelson supplies a complete line of polished rods of different metals and characteristics.

For light service #55 rods of cold-drawn carbon steel are usually recommended.

Medium service indicates #60 rods of medium carbon steel.

For normal to heavy service, alloy steel specially treated is used in #59 rods.

For special conditions involving severe corrosion and/or abrasion, Axelson polished rods are available in bronze, stainless steel, Axtrahard hard-faced, and chromium-plated.

"Triple-H" Polished Rods. These are an example of the new materials which Axelson research is developing. "Triple-H" polished rods are currently available in two lengths for the 26-foot and 31-foot Hydrax Pumping Units. This rod is made from a special stainless steel alloy, precipitation-hardened to a Rockwell C reading of about 40. It is extremely resistant to both abrasion and corrosion, and has a tensile strength of approximately 110,000 psi minimum yield.

"Triple-H" rods have seen wide use, particularly in West Texas wells where corrosion is severe and abrasion has always been a problem. "Triple-H" rods have been carefully inspected after two years continuous service under these difficult conditions, and no measurable wear, corrosion or metal fatigue has been found. The conclusion is definite that "Triple-H" polished rods outwear and outperform all others under severe conditions.

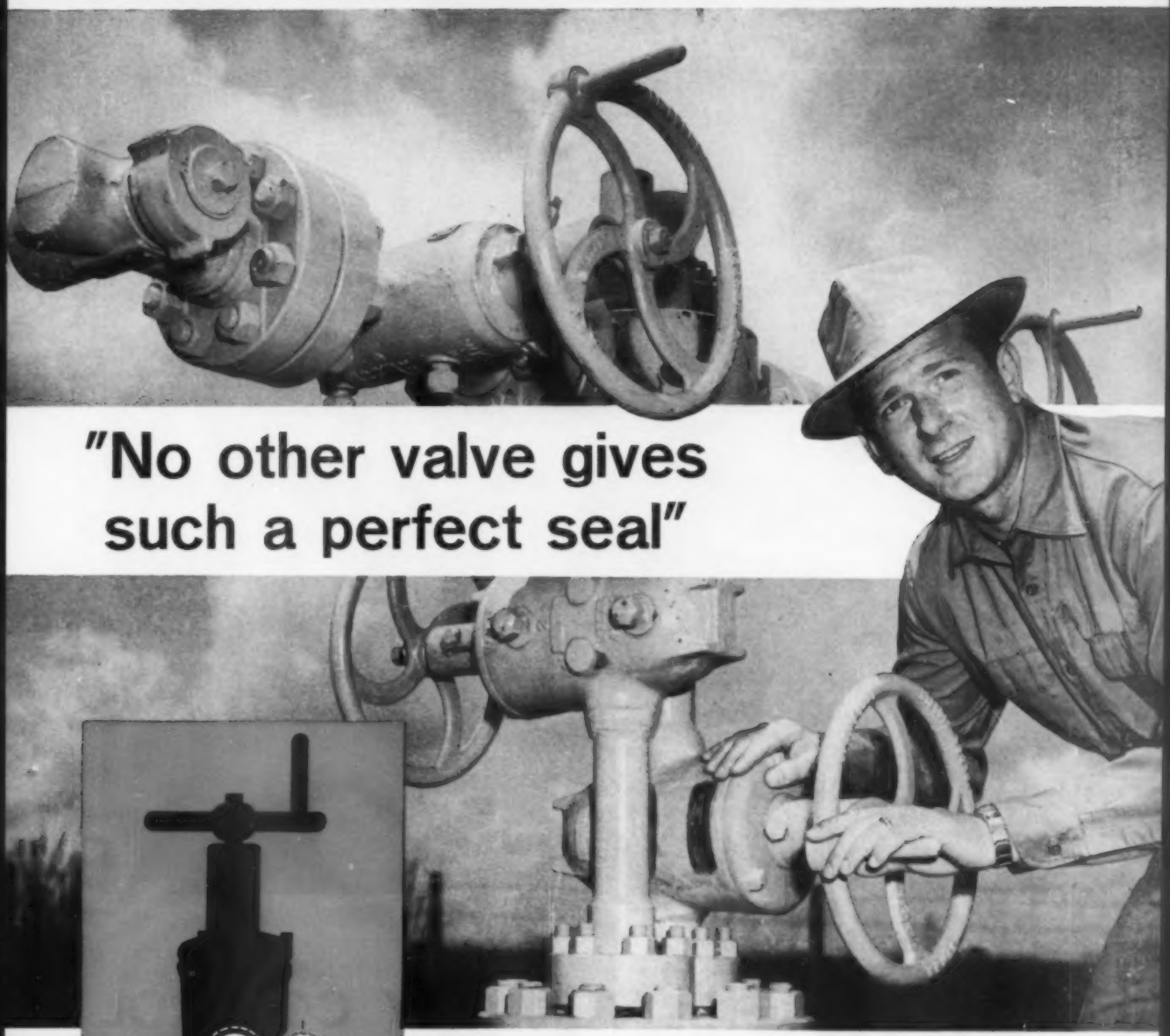
"Triple-H" rods are held to finish tolerances of less than .003"—a necessity with the high-pressure seals of hydraulic pumping units.

The maximum straightness and finer finish of all Axelson polished rods pays off at the well head in lowest possible friction losses for longer rod and packing life and reduced downtime.

Packing also is important for best service, and should be carefully chosen. Marlo packing cuts costs and friction both, because its special semi-metallic inserts form a smooth, resilient bearing-like surface which stands up in heavy service and will not harden or burn during pumpoff.

Your Axelson representative is qualified to recommend the combination of polished rod and Marlo packing which will give you greatest service with long term economy.

Tests show that the surface of an Axelson polished rod is measurably smoother than that of ordinary milled-finish rods. Axelson creates this finish by centerless grinding—a more expensive method, but the only one which will finish to Axelson specifications. In addition, close tolerances are held throughout manufacture to insure maximum straightness.



"No other valve gives such a perfect seal"

W-K-M Recessed Body Valves feature through-conduit gate construction, pressure seal bonnets, super-finished stems supported on roller bearings — and can be overhauled on-the-line.

Sizes: 1½", 1¾", 2", 2½" and 3". **Working Pressures:** 2000 through 5000 pounds.

PRODUCT OF W-K-M's *Creative Engineering*

W-K-M® Recessed Body Valves for Multiple Completions

No other valves give you such tight sealing, such dependable control.

W-K-M's Controlled Force Seating creates an initial bubble-tight seal between the gate and Teflon inserts. As the gate assembly expands, a tight metal-to-metal seal is achieved. Result: a perfect *Double Tight Seal* without body or seat lubrication.

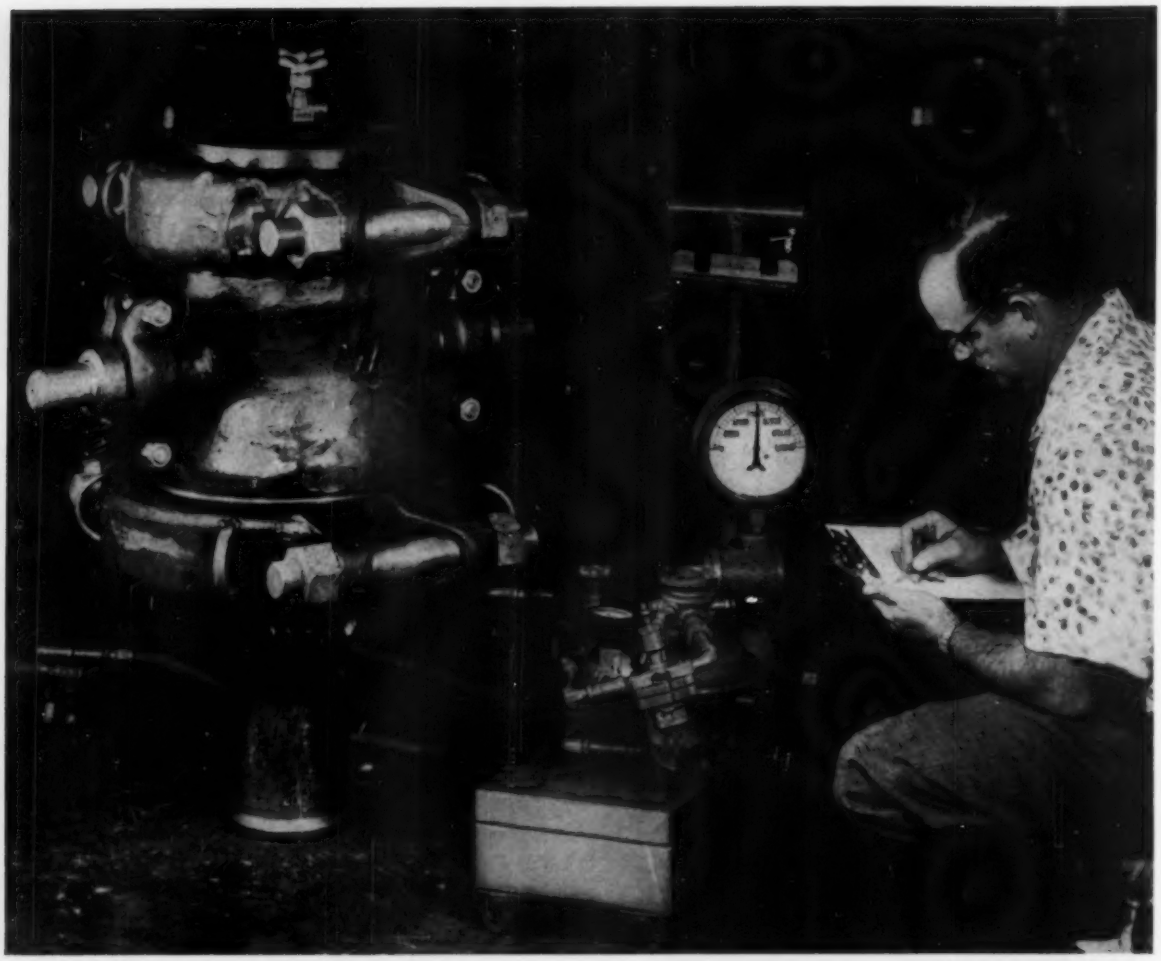
Next time — and every time — specify W-K-M! Recessed Body Valves are available for dual and triple completions. *At leading supply stores everywhere.*

WRITE FOR CATALOG 200

W-K-M

DIVISION OF acf INDUSTRIES INCORPORATED
P. O. BOX 2117, HOUSTON, TEXAS

5906-R



Another Step In...

GRAY QUALITY CONTROL

Every Gray well head component, as well as the assembled christmas tree, is forced through tests that exceed the demands of field applications. One situation is an internal pressure test: pressures up to 30,000 psi are applied. Gray's testing laboratory is your assurance that each component will fulfill the requirements of your well drilling and completion plans.

For more information about Gray well head assemblies and Gray Systems of Well Control, write today for your copy of the Gray Catalog.

GRAY *Tool Company*

6000

P. O. BOX 2291 HOUSTON 1, TEXAS REpublic 4-1641

e-con -o-my management with special regard for costs... and directly concerned with maintenance or productiveness. WEBSTER

Economy of capital expenditure is realized with the purchase of an Oilmaster Subsurface Hydraulic Pumping System at an investment that may run as low as half that of any other method of artificial lift.

Economy of installation is apparent when the Oilmaster Bottom Hole Assembly and the parallel string are run and landed independently at a small fraction of the rig time required to run a clamped string.

Economy of operation pays out with the trouble free and efficient operation of the Oilmaster unit.

Economy of maintenance becomes a reality when the Oilmaster Free Type Unit is surfaced hydraulically—then repaired by qualified personnel in well equipped, strategically located pump shops.

Ask your Oilmaster representative to give you details on this economical method of production, or write for Bulletin E5903.

Pumping is our Business

In 1936 the Fluid Packed Pump Co. introduced a totally new concept in full barrel pump design—the Oilmaster Volume Producer—the first pump ever to employ a hardened and honed full barrel, and the first insert pump ever to combine the advantage of capacity with the high precision and abrasion resistance of hardened and honed steel tubing.

Since 1936 the Oilmaster Volume Producer has been acknowledged leader in pumping fields the world over—frequently copied but never equalled.

FLUID PACKED PUMP CO.
DIVISION OF THE NATIONAL SUPPLY COMPANY
Los Nietos, California
Distributed by the
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B and W Inc.

PRIMARY CEMENTING TOOLS

For a Good Cement Job

3 REQUIREMENTS FOR A GOOD CEMENT JOB

Field research, as reported in technical papers, has confirmed that

1 SCRATCHERS 2 CENTRALIZERS 3 MOVEMENT OF CASING

are the three requirements for elimination of channeling and the complete displacement of mud behind the casing by ascending cement slurry.

All of these elements are equally essential, and a full-coverage, standard pattern installation is your best insurance **for a good cement job.**

Don't Squeeze $ Don't Squeeze $ Don't Squeeze

B and W Scratchers – for rotation or reciprocation

B and W produced the industry's first scratcher 20 years ago. The development of the multiple-strand scratching unit, the B and W Multi-Flex Scratcher, solved the problem of mud removal, and resistance to deformation in normal or enlarged holes. The hinged structure of the B and W Hinged Nu-Coil Scratcher simplified installation on the casing.

Field usage over a 20-year period has confirmed the results established by research, and the choice of scratcher usage **OR** expensive "block" squeezing must be made by management on a cost basis.

Don't Squeeze $ Don't Squeeze $ Don't Squeeze

B and W Centralizers – with the stronger KON-KAVE BOW

Following World War II, B and W Inc. introduced the original hinged centralizer – the B and W Latch-On Centralizer – and this design has now been generally accepted throughout the industry.

B and W Centralizers are the best and most dependable tools for

(1) Getting casing to bottom
(2) Combining with scratchers to prevent channeling
(3) Centering the casing in the drilled hole for an equalized column of cement

The outstanding construction features include:

(1) **Hinged Feature** – for easy installation
(2) **KON-KAVE BOW** – Cross-sectional arch for greatest strength
(3) **Highest Quality Spring Steel** – triple heat treated
(4) **Three Bow Designs** – For positive centering in various hole size/casing size combinations; e.g., 5½" casing in 6¾", 7⅞" or 8¾" hole.

Don't Squeeze $ Don't Squeeze $ Don't Squeeze

B and W Friction-Lock Clamp

Eliminate welding on casing and save money with this positive holding device.

GULF COAST
Box 5266
Houston 12, Texas
Phone WAlnut 3-6603

B and W Incorporated

Well Completion Specialists

WEST COAST
19706 S. Normandie Ave.
Torrance, California
FAculty 1-2463

147

Standardize on Thompson
OIL WELL PUMPS

Sand Protected
SUB-SURFACE ROD PUMPS

Self-Aligning
SAND SEALED-OFF
ROD PUMPS
Figs. 600, 800, 900

Inverted combination single or double plunger self-aligning pumps, equipped with sand flush valve
- Cleans barrel every stroke
- Sand deposited in blind cage discharged every stroke
- Plunger bottom sealed to prevent slippage
- Fits any API seating device; use adapter for other types
- Full working stroke assured

Fig. 201A

COMBINATION
ROD GUIDE and
PARAFFIN SCRAPER

Exclusive Thompson device, standard with many operators!
- Reduces rod & pump wear
- Insures proper alignment
- Removes paraffin ahead of pump
- Allows pump to pull freely

SERVICE STORES for your convenience! Stores have service men as well as salesmen to serve you . . . prompt pick-up and delivery!

SERVICE STORES
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Edmond, Okla.-Ph. 126
Eureka, Kansas-Ph. 1479
Healdton, Okla.-Ph. 668
Heidelberg, Miss.-Ph. 3871
Kilgore, Tex.-Ph. 3614
Natchez, Miss.-Ph. 4795
Oil City, Miss.-Ph. 4615
Reed City, Mich.-Ph. Tenn 2-2461
Seminole, Okla.-Ph. 610
Shidler, Okla.-MI 3-2011
Stephens, Ark.-ST 6-5487
Vivian, La.-Ph. 3680

SUPPLY STORES
Kemp Oil Well Supply, Gainsville, Texas
John & Paul Pump & Supply, Gladewater, Texas
Jack Yates Pipe & Supply Co., Gladewater, Texas
Midway Pipe & Supply Co., Greggton, Texas
W-B Pump & Supply Co., Pampa, Texas
B-H Pump Service, Selman City, Texas
Happy Co., Salem, Illinois

Thompson
PUMP COMPANY
Drawer 591 Okmulgee, Oklahoma

Well Servicing

Hydraulically Operated Wire Line Oil Saver

302 Hydraulically operated wire line oil saver, Guiberson's Type H, features a large, one-piece rubber packing element of exceptionally long life. Unique design of rubber and bushings forces the rubber to feed inward as well as upward and downward in order to effect a more constant seal.

Unit has a full 2½ in. ram stroke. Spring-loaded ram returns to normal relaxed position when hydraulic pressure is released.

Guide bushings are 2⅜ in. long and are made of non-sparking bearing material. Bushings are split into halves for easy assembly on the line and top and bottom bushings are interchangeable.

Bushings and rubber are held in the body by a gate which is slotted to receive the line and keyed to the body by a quick-change yoke.

Base is available with 2 in. EUE 8 Rd, 2½ in. EUE 8 Rd, or 3 in. LP 8V field connection. By changing the base, saver may be converted to any 1 of 3 field connections. *Guiberson Corporation.*

Slim Hole Sand Pump

303 A new slim hole 2 in. OD Sand Pump for 2⅞ in. OD slim hole completions has been introduced by Miller Sand Pump.

Sand pump has identical design to company's larger pumps. It has accurately machined lug-type bottoms. Lengths are 20 to 24 ft. *Miller Sand Pump Company.*

Rod Elevator

304 Rod elevator designed to prevent bending or kinking of sucker rods even under heaviest loads has been placed on the market by Byron Jackson.

While retaining the arrangement of a reversible U-shaped body pivoted in the elevator bail, new body design employs stops which prevent rotation about the trunnion under load. Entire string is always freely supported in the body seat in line with the lifting load so that there is no possibility of kinking rods even under the heaviest loads.

Bail, which is freely pivoted, swings out of the way or stops upright to receive the hook. The reversible type body has rod seats at the top and bottom, for improved service life. There is no danger of dropping the string, since the front latches must be opened by the operator before the rod can be released.

Elevator is available in a variety of sizes. *Byron Jackson Tools, Inc.*

Circle the corresponding number on the Reader Service Card for further information from the manufacturer

NEW FROM HALLIBURTON

HR-12 for deep well cementing!

NOW . . . another new product from Halliburton Research! HR-12 represents a giant step forward in the search for better cement retarders for today's deeper wells. Already used successfully below 19,500 feet, HR-12 is pointing the way toward the practical placement of cement in even the *deepest* wells. Bottom hole temperatures exceeding 380° have been encountered without affecting the retarding ability of this amazing additive. Costs are lower than you would expect, too . . . because HR-12 works so efficiently that far less is usually required to do the job than with many other additives.

When you're drilling the deep ones, call your Halliburton man for the full story on HR-12. He'll be glad to guide you in its use.

PROVEN PARTNERS TO HR-12

■ **HALLIBURTON HR-4** . . . an excellent cement retarder for use to 12,000 foot depths where normal temperatures prevail.

■ **HALLIBURTON HR-7** . . . designed to disperse and retard high gel cement slurries.

TODAY'S PRACTICE . . . TOMORROW'S PROMISE . . . "YOU DRILL IT—WE'LL CEMENT IT!"

HALLIBURTON CEMENTING SERVICES

HALLIBURTON COMPANY • DUNCAN, OKLAHOMA

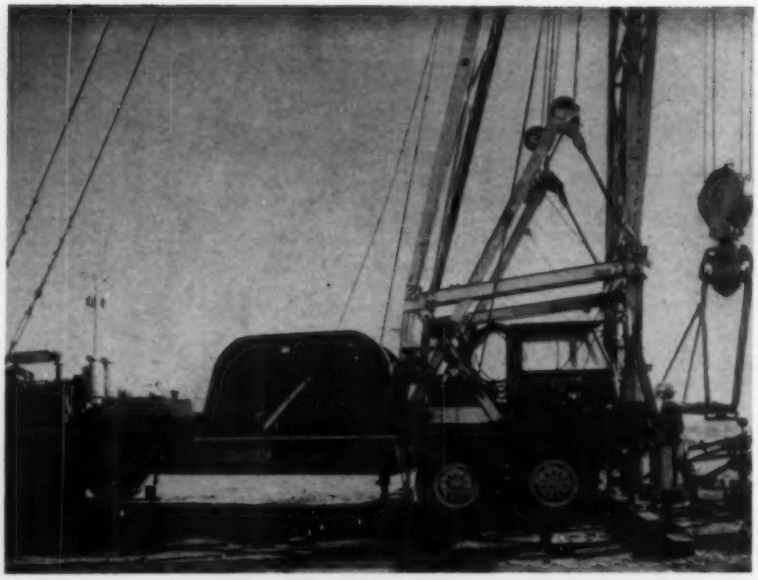
FOR FURTHER INFORMATION ON ADVERTISED PRODUCTS, SEE READER SERVICE CARD B-113

Rod Wiper, BOP

305 Gearench Manufacturing Company has announced its Petol rod wiper which not only wipes rods but also acts as a blowout preventer. One size handles all sizes of rods from ⅝ in. to 1 in. without any changes. Rubbers can be changed in a couple of minutes. The unit measures 28½ in. long, 9½ in. high, and 5½ in. wide. Upper and lower body threads are 3-in., 8V. Vertical opening through the body of the unit is 2⅝-in. diam. Short swage nipples to fit 2-in. and 2½-in. couplings can be furnished. *Gearench Manufacturing Company.*

Self-Propelled Service And Workover Rigs

306 Development of 2 self-propelled "drive-in" type service and workover rigs has been announced by The National Supply Company. Model 200 is rated for depths to 8000 ft, with nominal range of 150 to 200 hp; Model 300-B for depths to 12,000 ft, with nominal range of 250 to 350 hp. Rigs are mounted on a specially-designed truck with power for both truck and rig provided by a single engine power unit providing 3 forward and 1 reverse speed.



Available with folding or telescoping mast, the units have racking platforms with capacity for 10,080 ft of 2⅞-in. OD tubing. Drawworks main drum dimensions are: Model 200, 12¾-in. diam by 36 in. long with 39½-in. diam flanges; Model 300-B, 16-in. diam by 37 in. long with 48-in. diam flanges. Both drawworks are double-drum type with steel plate box type frame construction.

Controls for the main drum, transmission, and engine throttles are mounted on the mast outrigger and are arranged for ground-level operation. Controls for the sand reel are on the driller's side of the drawworks near the cathead position. *The National Supply Company.*

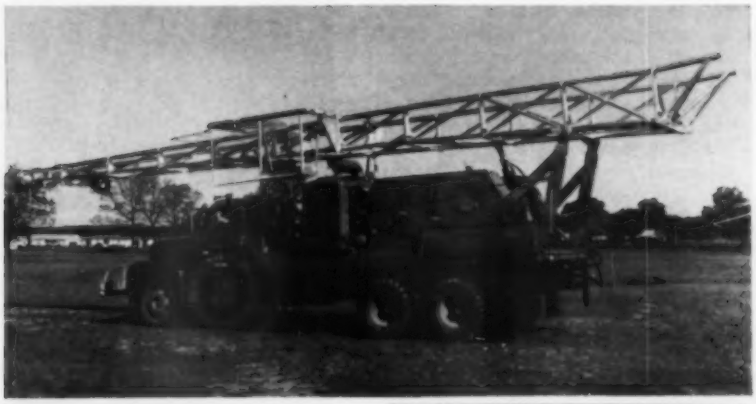
HERCULES WELL HEADS for use with REDA PUMPS...

Hercules Well Heads, designed for use with Reda submersible pumps, contain the same high quality workmanship and materials found in Hercules Conventional well heads. They simultaneously pack-off the inner string and Reda cable by means of custom-made metal and neoprene packing rings for each tubing-cable or casing-cable combination.

Shown above is a quarter section view of the Hercules Type RC Tubing Head and at far left the same head on a well in water flood project at Electra, Texas.

Write for complete information or personal help from our staff to assist you in your water flood projects.

HERCULES TOOL COMPANY
MANUFACTURERS OF OILFIELD EQUIPMENT
GENERAL OFFICES AND PLANT • TULSA, OKLAHOMA
Export Representative Oil Field Equipment Co. Inc. 90 West Street, New York, N. Y.



Single, Double Drum Servicing Rigs

307 Rated for servicing to 5500 ft with 2½-in. tubing is a new series "32" oil well servicing unit with newly designed 32-in. by 8-in. brakes. Model "32" single or double drum rigs are offered with various makes of separate engines, or in a truck powered model. Spudding or rotary drive equipment is available on all models. The "P-32" series has Cooper positive-type, in-line clutches and can be skid or truck mounted. The "A-32" series offers air friction drum clutches, torque converter or standard transmission drives. Particularly adaptable to the "32" series models is a new 50 or 55-ft Cooper tubular steel derrick — with tubing racking board, rod hanging equipment, wire line or hydraulic raising. *Fred E. Cooper, Inc.*

Unique-Bladed Knife Cuts, Lifts Paraffin

308 A paraffin knife with opposite rotating spiral blades has been announced in two models — one for flowing wells and one for wire lines — both in 2 or 2½-in. size. The model for flowing wells — with lubricator and spring-loaded bumper sub for easy installation on the wellhead—is made of two equal length blades connected by a swivel with a fishing neck at top and a stop and swivel on bottom. Descending, the blades rotate in one direction, cutting paraffin from the tubing wall; returning, blades rotate in opposite direction, lifting paraffin for free flow through lines. A model for wire lines is built on a 2-ft sucker rod sub and is easily attached to rods. When attached to wire line with sucker rods on bottom for weight, the tool becomes a spiraling auger that cuts paraffin when lowered into the tubing; and pulls free paraffin to the top on its return, when a unique clutch locks the bottom blade firmly. *The Happy Co.*

Hydraulic Cleanout Tool Assists in Fishing Jobs

309 Designed for use in fishing out stuck drillpipe, drill collars, and tubing is a new hydraulic cleanout tool now available at McCullough Tool Company. Unit is designed to be run on electric wire line to clean out mud and formation bridges, drill collars, or tubing which have been plugged while washing over. Basic cleanout operation is the same for pipe, collars, or tubing.

Tool consists of a string of small, flush-jointed washpipe made up of 1¾-in. OD by 10-ft alloy tube sections. A

We all insure our valuable equipment against accidental damage or loss. Why not help insure expensive tubing and sucker rod strings against unnecessary wear and service by making a small investment in OIL STATES Rubber Sucker Rod and Tubing Guides?

IT JUST MAKES GOOD BUSINESS SENSE!

Invest a little to protect a lot. OIL STATES Guides protect your tubing and rods because they:

- Prevent metal-to-metal contact between rods and tubing
- Centralize tubing in casing, minimizing "breathing" of tubing
- Lessen wear on pump by deadening "rod whip"
- Prevent paraffin build-up when properly spaced

OIL STATES RUBBER SNAP-ON GUIDES ARE EASILY INSTALLED AS RODS AND TUBING GO INTO THE WELL. THEY DO NOT OBSTRUCT FISHING TOOLS.

"Oilfield Rubber Products Of Matchless Quality"

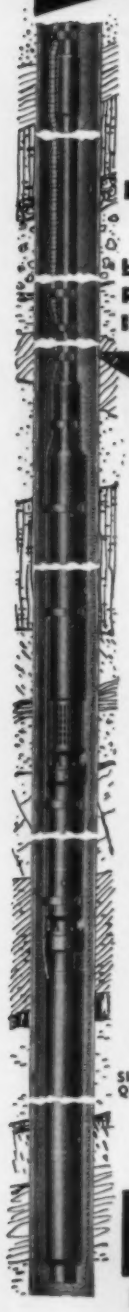
See your local OIL STATES Field Representative for additional information or write or call —

Oil States **OIL STATES RUBBER CO.**

P. O. Drawer 152 • Arlington, Texas

OSR-12

REDA PUMPS



FIRST CHOICE

FOR SECONDARY RECOVERY WATER FLOODING...

because pumping with REDA lowers costs and INCREASES PROFITS!

HERE'S HOW:

- Large water volume obtained from smaller size well casings reducing number of supply wells necessary
- Flexibility of Reda Pumps in meeting changing water requirements common to most waterflooding projects
- Easier, less expensive installation and lower maintenance costs
- Low operating costs and long operating life of Reda equipment
- Corrosion resistance of Reda pumps is superior to any other pumping unit used in supply wells

Reda Submergible Pumps are a major factor in the success of waterflooding and pressure maintenance operations. They are being used in major floods with very successful results of increased production and lowered costs.

Write for complete information today! Reda engineers will be pleased to call and assist in planning operations.

SIGN OF QUALITY . . . SUBMERGIBLE REDA PUMPS

REDA

PUMP COMPANY

BARTLESVILLE, OKLA.

cleanout shoe is installed at bottom of cleanout string and a magnetic collar locator and an electric rope socket at the upper end. Unit is lowered through a special packing head sub installed on the top of pipe or tubing to be used in fishing operation. *McCullough Tool Company.*

Controlled Solubility Phosphates Prevent Scale

310 Crystal growth in producing oil wells is inhibited and scale thereby prevented by a new development called Controlled Solubility Phosphates. Glassy phosphates are chemically controlled to dissolve slowly, making it possible to set up weekly, bi-weekly, or monthly feeding schedules. They are absorbed on the

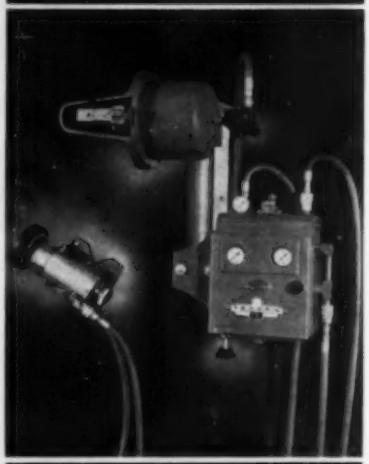
nuclei from which crystal growth would normally proceed, stabilizing a condition of supersaturation. Result is inactivation of the nuclei. Phosphates can be added directly to producing wells by dropping measured quantity down the annulus, with individual particles carefully sized to fall freely through condensate zones, oil layers and heavy brines. Once down the well bore, self feeding action commences, enabling continuous treatment through regular addition of phosphate. *Hagan Chemicals & Controls Inc.*

Blowout Preventer For High Pressure Situations

311 For safe well control when using solid type measuring lines under exceptionally high-pressure conditions, Bowen Itco, Inc. is offering a high-pressure wireline blowout preventer. The hydraulically-actuated segment type preventer has tested to 20,000 psi seals efficiently, and features remote operation. Recommended working pressure is 10,000 psi.

Preventer is to be used just above wellhead, and the lubricator and line wiper are assembled above the valve.

The NEW GEODRIL® AUTOMATIC DRILLER



gives you

1. LONGER BIT LIFE
2. FEWER TRIPS
3. STRAIGHTER HOLE

The GEODRIL Automatic Drilling Control was developed, tested and proved in the field by The Geograph Company, manufacturers of the internationally accepted Geograph Mechanical Well Logging Recorder.

The new, automatic GEODRIL control has many outstanding features and offers the drilling contractor dependability, economy and safety.

Service for the GEODRIL Control is provided by the experienced personnel of Geograph Oil Field Services. Their reputation for service is backed by over a fifth-of-a-century of experience in the oil fields.

When you drill your next well, specify the NEW GEODRIL Automatic Driller for maximum drilling efficiency. For additional information, contact your nearby Geograph Oil Field Services office.

GEODRIL® AUTOMATIC DRILLER

GEOLOGRAPH®

OIL FIELD SERVICES

P. O. Box 1276 • Oklahoma City 1, Okla.

Safe control features make the unit particularly adaptable to permanent well completion services. Small OD tools used in completions will move easily through ID of BOP. Segment rams are specifically designed for the complete shut-in of the well on 0.066 to 0.092-in. measuring line. Preventer cannot be used with stranded or armored cables normally used in conductor line services because segment rams will not close completely on the larger diameter lines. Unit is made from high grade steels, heat-treated to insure maximum performance. *Bowen Itco, Inc.*

Corrosion Inhibitors

312 Developed specifically for oil and gas well squeeze applications is a series of new filming organic corrosion inhibitors. New materials are said to show marked improvement over conventional batch-treating or continuous-feed inhibitors in that they have controlled solubility under well bore conditions. One application generally furnishes 3 to 12 months production. Effective against carbon dioxide, hydrogen sulfide, organic acids and corrosive brines, they provide persistent protective film on metal surfaces. Squeeze treatment is recommended according to well type and characteristics. *Visco Products Company, Inc.*

Bellows Relief Valve Has Alarm System

313 Bellows relief valve for vapor service, introduced by J. E. Lonergan, has several unique features.

An alarm warns of bellows rupture, either as self-contained unit or remotely controlled, and a versatile cap arrangement provides a bolted standard cap which can be interchanged with a packed cap. Cap contains provision for gaging without taking the valve out of service.

Bellows relief valve is interchangeable with conventional one-ring valves. Knock-out nozzle is designed to greatly simplify nozzle replacement. By using a chisel and a hammer, the nozzle-holding nut can be split and the nozzle can slip out of the valve.

Company's hydro design valve is designed to eliminate chatter. There are 2 seating surfaces in one disc, which allow it to be reversed if one side is damaged. Valve provides a balancing action against a variable back pressure. *J. E. Lonergan Company.*

Circle corresponding number for further information from the manufacturer.

COSTS GO DOWN, DOWN, DOWN

The Hunt-De Cordova Washover and Recover Cutter has established new all time records for the recovery of tubing and drill pipe from the outside.

For job data sheets that prove it saves time and money write or telephone any Hunt Tool Company office. Or request our Technical Bulletin No. 505 for complete details.

HUNT TOOL COMPANY

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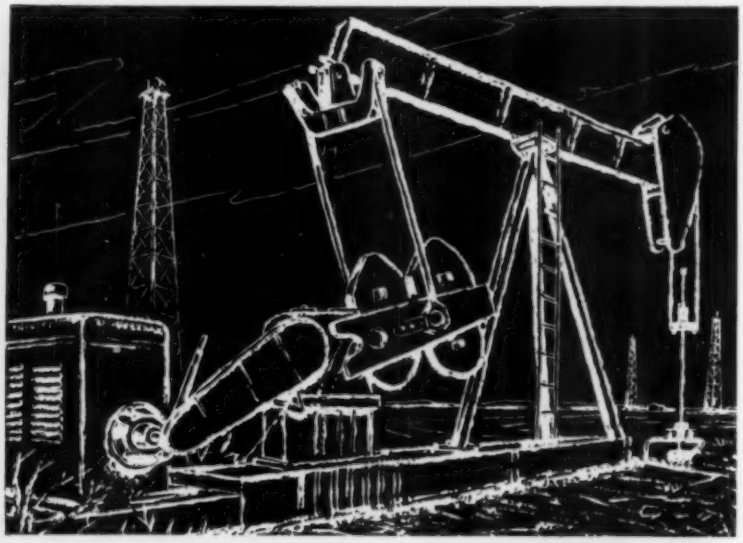
HUNT TOOL COMPANY OFFICES: Bay City, Corpus Christi, Gainesville, Tex.; Harvey, Jennings, Morgan City, La.; HUNT SHIPYARD DIVISION, Harvey, La.; HUNT EXPORT COMPANY, Houston, New York City, Rio De Janeiro, Buenos Aires.

Mass Flowmeter For Gas Flow

314 A "true" mass flowmeter is provided for natural gas automation systems by Black, Sivalls & Bryson, Inc. The meter, which directly measures gas flow by weight, was developed by BS&B and General Electric.

The flowmeter weighs the gas stream directly and continuously over a wide variation in flow rates, densities, pressures, and temperatures. Since the meter measures directly by weight, time-consuming conversion calculations are not necessary. In gas production, the flowmeter finds ready applications at the wellhead and in well gathering systems. *Black, Sivalls & Bryson, Inc.*



PUMPING POWER
means production power!

Production power means time and money saved. Rockford Power Take-Offs are the perfect, controlled power-link between engine and work. These PTO's are used on many oil field rigs, independent power units, and built-in-engines. Next time specify Rockford. Many sizes and types of PTO's and clutches are available. Write today for complete details.

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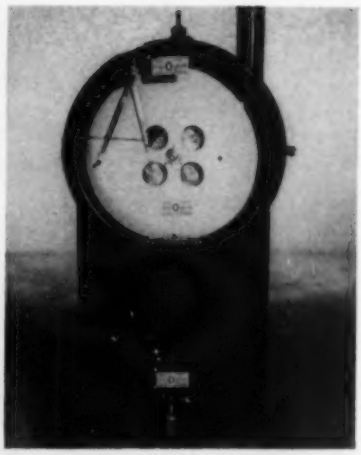


Automatic Chart Changer Holds Up to 32 Charts

315 The Dial-O-Graph automatic chart changer is being produced by Mullins Manufacturing Company. The changer works from the chart drives and requires no additional power. Adaptable to most measuring instruments using circular recording charts, the changer permits stacking of charts in chronological order, with the wet chart always on top.

The units are available for rectangular case or round case in either 24-hr rotation 8-day wind; 7-day rotation 31-day wind jewelled; 24-hr rotation gas drive; or 2-hr rotation gas drive. *Mullins Manufacturing Company.*

Pump-Off Control

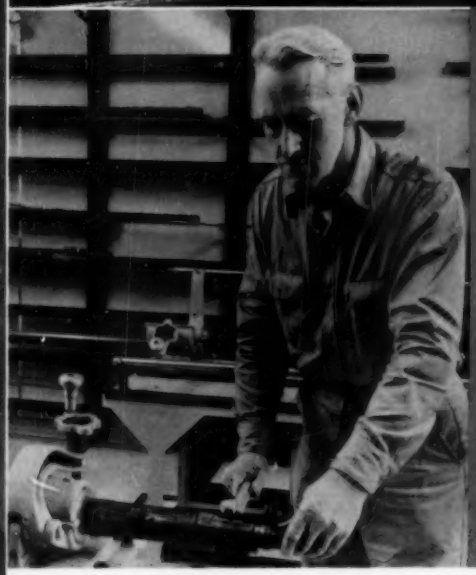
316 A control system designed to solve some of the operating problems surrounding oil well pump-off is announced by Cutler-Hammer Inc. The equipment is basically a simple flow meter. Rate of flow is monitored by an electrically self-heated thermistor probe installed in the lead line between the wellhead and the first check valve. The pulsating flow of fluid, delivered with each stroke of the reciprocating pump, gives rise to voltage pulsations across the thermistor. Upon pump-off, the fluid flow diminishes and a corresponding reduction in the signal from the thermistor occurs, causing a transistor controlled relay to stop the pump.

The pump-off control is designed to operate under a wide range of field conditions. Since pump-off is sensed by direct measure of fluid production, outside factors have no influence on its operation. *Cutler-Hammer Inc.*

CUT PUMPING COSTS

Specify CONTINENTAL-EMSCO

PRODUCTION EQUIPMENT PACKAGES



TAME PROBLEM WELLS with D+B pumps engineered for your profits

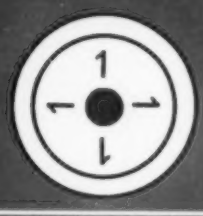
Why pay for excessive subsurface pump failures? Have a D+B Production Equipment Specialist *engineer* a longer lasting pump to reduce costly pulling jobs. He'll design it for your well's *peculiarities* . . solving such problems as: corrosion, gas, sand, high or low volume demands, crooked hole or changing conditions due to waterflooding, acidizing, sand fracturing. D+B pumps are designed to operate in *engineering harmony* with your other pumping equipment for lowest over-all pumping cost.

Cut costs, too, by using your nearby D+B pump shop. Here factory training puts the D+B pump specialist way ahead in subsurface pump application and repair . . gives him added judgment so necessary in selecting the *right* replacement part to meet a particular well condition for longer pump life . . greater efficiency.

Start now to cut your pulling costs by specifying D+B pumps and service from Continental-Emsco . . a fully integrated supply company dedicated to developing and providing the equipment and service you need to cut production costs.

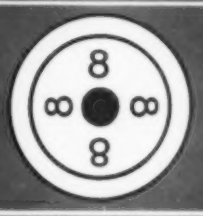
Continental sucker rods
..engineered to PUMP LONGER

With deeper wells going on pump..corrosion developing from waterflooding..
inhibited wells..it takes an *engineered* string to keep your
equipment repairs and pulling costs down..profits up. It's here that
Continental-Emsco, a fully integrated supply company, is superior
to local supply sources in assisting your engineering department or in operating
independently to develop a rod string that's *profit-engineered* especially for you.

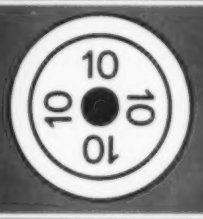


CONTINENTAL ⌀ 1 SUCKER ROD
An economical rod with tremendous staying power in noncorrosive wells or where an inhibitor is used . . yield strength range 60-75,000 psi.

CONTINENTAL ⌀ 5 SUCKER ROD
A medium priced rod with an amazing performance record, primarily due to vanadium, which gives it a strength equalling many so-called "high tensile" rods . . yield strength range 71-92,000 psi.

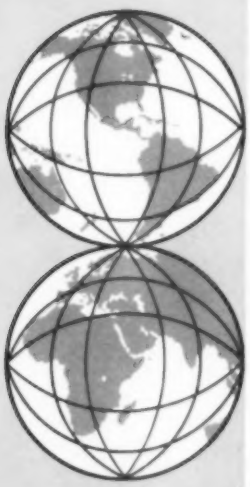


CONTINENTAL ⌀ 8 SUCKER ROD
The new Continental ⌀8 rod is priced lower than Continental's premium ⌀10. It offers a moderate degree of corrosion resistance plus top load capacity . . typical yield strength 113,000 psi.



CONTINENTAL ⌀ 10 SUCKER ROD
The premium quality of this rod results in exceptionally long pumping life in deep problem and hard pumping wells, where its high ductility and corrosion resistance pay off . . yield strength range 95-110,000 psi.

CONTINENTAL ⌀ 11 SUCKER ROD
The finest rod in the Continental line. Its low carbon and high nickel content provides high load carrying capacity in corrosive wells . . yield strength range 90-105,000 psi.



WORLDWIDE SERVICE

You can always depend upon the superior performance of Continental sucker rods, whether you operate statewide . . nationwide . . worldwide. This dependable performance is maintained by unexcelled quality control at C-E's plant and constant supervision of C-E stores and representatives throughout the world.

CONTINENTAL-EMSCO UNIT PUMPERS PERFORM BETTER BECAUSE THEY'RE ENGINEERED BETTER

Taller samson posts reduce angle A (compare with angle A_1). This improved geometric design makes well loads more nearly equal at wrist pin and polished rod for added efficiency. There's less load and wear on bearings, gear teeth, belts and prime mover.

See in the sketch how torque has been reduced by the smaller angle between pitman and walking beam. This improvement reduces loading on gear teeth, cuts electric costs or fuel consumption and makes counterbalance applications more effective . . often eliminating the need for buying extra weights. Today . . more than ever before . . you can match a unit to individual well re thanks to C-E's wide range of sizes and counterbalancing method. No need to b oversized unit or worry with the incre tenance caused by overloading an unde

C-E unit pumper's maintenance costs reduced with prelubricated bearings, a life has been extended by using bea B-10 rating. Standard QD sheave replacement and reduce cost. Oil tro been cast into the gear reducer to simpl spection and cleaning and to improve

Start cutting your production costs, s unit pumpers . . *profit-engineered* for

CUT LIFTING COSTS with the complete CONTINENTAL-EMSCO PRODUCTION PACKAGE

CONTINENTAL-EMSCO ENGINES

These engines greatly reduce pumper's servicing time due to engine's easy-to-start, easy-to-adjust and easy-to-maintain features. C-E engines maintain production schedules in all types of climatic conditions. Simple design, easy accessibility of working parts and unit assemblies cut repair time.

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undersized unit.

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C-E GREEN TRIANGLE ELECTRIC MOTORS

Designed *exclusively* for rugged oil field pumping, these motors provide steady, sure, economical power. They have 5-8% slip . . 275% starting torque . . 40° C rise with a *guaranteed* 1.15 service factor. A built-in balance meter makes it possible to accurately balance your well. And by glancing at the meter, field personnel can detect subsurface trouble.

CUT COSTS WITH ACCESSORIES IN HARMONY WITH THE COMPLETE PRODUCTION UNIT

D+B QUICK-GRIP CLAMP

See how simple it is for one man to tighten this clamp. "Knuckle-busting" is completely eliminated.

CONTINENTAL-EMSCO API POLISHED RODS

Whatever your well condition, you can *top* your sucker rod string with one of five Continental polished rods and be assured of the highest quality in workmanship and materials with longer service life.

GREEN TRIANGLE SUPER V-BELTS

40% MORE CAPACITY NO PRICE INCREASE

These features . . new type fabrics . . unitized cover . . latex impregnated cord fibers with cord set in belt under tension . . no inner or outer joints or laps . . give GREEN TRIANGLE SUPER V-BELTS longer life, uniform loading and less vibration. Also, flexibility has been retained for easier bending over sheaves, while stretch has been reduced for less field adjustment. Belts are packed in *matched sets* to guarantee uniform, superior performance from each one. They are manufactured by New York Belting and Packing Company, America's foremost producer of oil field rubber goods.

Quick Service from Local D+B Pump Shops

Continental-Emsco Store at Maracaibo, Venezuela

CONTINENTAL-EMSCO IS THE FOCAL POINT FOR SALES AND SERVICE IN PRODUCING AREAS THROUGHOUT THE WORLD

Wherever you pump oil in the U.S.A., Canada, South America or remote producing fields of the world, you'll find that Continental-Emsco stores or representatives have preceded you there. This means a world-wide supply of proven production equipment, experienced personnel to help in equipment application, and a dependable source of repair and replacement parts. So, remember when you go *worldwide . . go Continental-Emsco.*

For Service that Sings . . Equipment that Hums . . Go

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Representatives in All Principal Oil Fields of the World

P920-R Litho in U.S.A.

PD Meter Has One Moving Part

317 The Floco meter, manufactured by Flow Equipment Company, Inc., is a positive displacement rotary type meter, designed to meter fluids accurately with a minimum of attention and maintenance. The design features only one moving part actuated by the fluid flow, a rotor with flexible blades compressed by a positive displacement stationary cam. Balanced rotor design with rotation always in same direction without metal-to-metal contact, reduces friction, minimizes wear, resists corrosion, and operates with low pressure drop and sustained accuracy. *Flow Equipment Company, Inc.*

Pressure Control Pilot

318 Developed to allow pressure to be taken from two separate points is a new high-low pressure control pilot now offered by Merla Tool Corporation. Designated E-1, new unit is used as a pressure safety control high-low shut-off and for well purger, back pressure and pressure reducer series. Wide pressure range up to 2000 psi is available through use of interchangeable pressure range springs. Features include snap-action; pressure-balanced diaphragms; resilient, large-area, non-leak seat; non-bleed pilot; torque-free spring action; low friction piston seal and non-corrosive parts with over-range protection for pilot section. Compact control mounts on side of motor valve and is encased in stainless steel. *Merla Tool Corporation.*

Flow Recorder For Field, Offshore Uses

319 The new Model 202A Flow Recorder has been introduced by Barton Instrument Corporation. Actuated by the Barton Model 119 rupture-proof meter body, the new model's case and recording mechanism feature the use of stainless steel in all internal parts. Special attention has been given the micro-linearity adjustment on the torque tube drive arm, as well as to micro-meter adjustments for zero and range, in an effort by the manufacturer to provide rapid and precise calibration.

The new case has been designed for operation in various climatic conditions. *Barton Instrument Corporation.*

High-Low Pressure Control Pilot

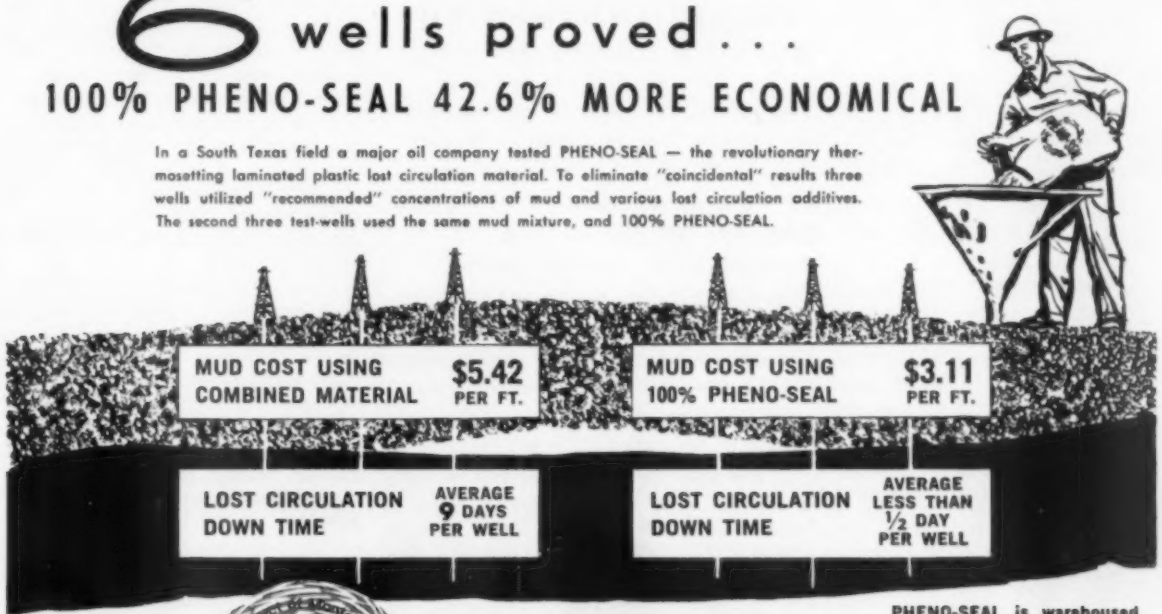
320 Now being marketed by Macco Oil Tool Company is a high-low pressure control pilot, a non-bleed snap acting unit for on-off control. The bourdon tube actuates the pivot arm which regulates the high and low cut-out point. Unit is useful as high-low safety shutin and flow control on oil and gas well flow lines, and for pressure regulation on gathering and gas transmission lines where a snap-acting, "no freeze" pilot is desired.

Unit is made of corrosion resistant stainless steel and anodized aluminum throughout, and the aluminum case gives air-tight weather protection to controls. The unit's pressure rating is determined by the size of the bourdon tubes, which are available in low, intermediate or high-pressure ranges or a maximum of 7500 psi. Accuracy of the high and low cut-out point is within ½ of 1 percent of the bourdon tube pressure range. *Macco Oil Tool Company Inc.*

6 wells proved . . .

100% PHENO-SEAL 42.6% MORE ECONOMICAL

In a South Texas field a major oil company tested PHENO-SEAL — the revolutionary thermosetting laminated plastic lost circulation material. To eliminate "coincidental" results three wells utilized "recommended" concentrations of mud and various lost circulation additives. The second three test-wells used the same mud mixture, and 100% PHENO-SEAL.


MUD COST USING COMBINED MATERIAL $5.42 PER FT.
MUD COST USING 100% PHENO-SEAL $3.11 PER FT.
LOST CIRCULATION DOWN TIME AVERAGE 9 DAYS PER WELL
LOST CIRCULATION DOWN TIME AVERAGE LESS THAN ½ DAY PER WELL

PHENO-SEAL is warehoused by all progressive mud service companies.

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Forged Seamless Ring Gaskets

321 Southern California Oil Tool Company offers a new line of forged seamless B-X ring gaskets which are completely interchangeable with all R-ring gaskets of corresponding numbers. The soft metallic gasket seals 2 flanges utilizing the internal pressure force to maintain the load-carrying ability. The gaskets are easily replaceable without damage to flange seat or fittings.

Gaskets are manufactured in 2 series with pressure rating up to 15,000 psi and comply with all API and ASA specifications and popular sizes. *Southern California Oil Tool Company.*

NEW BULLETIN

CAMCO Announces

WIRELINE SERVICE TOOLS- PRODUCTION EQUIPMENT

available through all recognized wireline service companies...

WIRELINE SERVICE TOOLS:
Rope Sockets
Stem
Jars
Knuckle Joints
Paraffin Cutters
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Tubing End Locators
Bailers
Running & Pulling Tools
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Magnaset Equip.
Slip Locks
Safety Valves
Blanking Plugs
Bottom Hole Chokes
Equalizing Subs
Standing Valves
Tubing Packoffs

The bulletin illustrated at left describes the complete line of CAMCO Wireline Service & Production Tools now available for use by all recognized wireline service companies. All tools are illustrated and described in this fact-filled bulletin. Operators will find the section on Sub-Surface Production Equipment a MUST. For operational information and catalog data on the newest production equipment from CAMCO . . .

. . . ask your Camco representative for a copy . . . or write:

CAMCO INCORPORATED

C605

P. O. BOX 14484 • 7010 ARDMORE STREET • HOUSTON, TEXAS

Piston-Operated Gate Valve

322 The McEvoy gate valve is now furnished with a piston operator, making it particularly desirable in automatic production equipment. The valve utilizes line pressure in the valve body to close the valve. Hydraulic pressure in the operator opens the valve and holds it open. Any failure in the hydraulic system causes the valve to close automatically. It can be controlled automatically by changes in pressure, temperature, tank levels, etc.

Used as a master or wing valve on production trees, it can serve as both a safety shut-off device and a flow control valve. Systems for operating and controlling the valve, from simple mechanization to complete automation, are available.

Optional accessories for the valve include a visual position indicator, remote position indicator switches, and special enclosures for underwater or hazardous locations.

Valves are available in 2 to 6-in. sizes and in working pressures up to 10,000 psi. Packaged power units for manual, electric, or pneumatic operation are also available. *McEvoy Company.*

Ball Valve Offers Positive Sealing

323 A new ball valve developed by Pacific Valves, Inc. utilizes elastomer seals and a unique design for absolute tight closures with line flow in either direction. Straight through, round ports promote efficient handling

ATLAS EMULSIFIER saves $15,125 in 5000′ comparison

Carper Drilling Company of Artesia, New Mexico, is typical of contractors and operators that have been able to effect substantial savings in drilling costs by using an Atlas emulsifier. Here is a direct comparison of the drilling records of Carper's State MA-A #1, located in Lea County, New Mexico, Section 31, 17S, 33E, and an offset well in Eddy County, Section 29, 17S, 31E. Both wells were drilled about the same time through the same formation to a total depth of 10,000 feet. The rig used on the Carper well was smaller, having lower power, hoisting, and hydraulic capacity. The comparison well, using a low-solids CMC mud, required over twice as many bits at an additional cost of $7,425; difference in rig time accounted for another $7,700 . . . a total of $15,125 in tangible savings.

DRILLING RECORD COMPARISON

	STATE MA-A #1	OFFSET WELL
Mud	Atlosol emulsion	low-solids CMC
Interval	5,123′-10,015′	5,263′-10,011′
Feet Drilled	4,892	4,748
Rig Hours	857	997
Feet per hour	5.7	4.8
Bits	27	60
Feet per bit	181	79
Weight on Bit	30,000-45,000#	60,000-65,000#
Drill Pipe	3½″	4½″
Drill Collars	17—6″ x 2¼″	20—7″ x 2¾″
Pumps	1—18″ 1—14″	2—20″
Liner Size	5½″	6½″

Atlas emulsifier is sold through distributors under these tradenames . . . each is the product of Aquaness Department, Atlas Powder Company:

TRIMULSO®

Distributed by Baroid Division, National Lead Company

Registered trademark Baroid Division, National Lead Company

DRILLING MILK

Distributed by Magnet Cove Barium Corporation

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ATLOSOL

Distributed by Milwhite Mud Sales Company and other selected mud companies

Registered trademark Atlas Powder Company

Atlas Emulsifiers Improve a Good Drilling Fluid.

Better Hole Conditions. Torque is decreased as much as 50% . . . the hole is kept cleaner and pump pressures are correspondingly lower. There is less danger in loss-circulation and low-pressure zones.

Longer Bit Life. Prevents balling, provides better cutter and bearing lubrication. Greatly extended bit life reduces bit costs, reduces rig hours lost to trip time.

Faster Drilling Rates. More feet of hole per hour. Oil lubrication combines with improved hole condition to increase drilling rates in competent and troublesome formations.

ATLAS Aquaness CHEMICALS ATLAS POWDER COMPANY

Aquaness Department, Atlas Powder Company

P. O. Box 21072 • Houston 26, Texas

AQ 11

of slurries, semi-solid fluids, and abrasive-loaded fluids or gases.

Quick, quarter-turn operation assures responsive, immediate full open or closed positioning. Lightweight, compact design cuts installation cost and valves can be easily installed in any position. Wide range of standard materials is offered to custom-tailor valves for particular applications at no extra cost and without delivery delay. Available in sizes ¼ to 10 in., in ductile iron, cast iron, bronze, aluminum or alloy steels. *Pacific Valves, Inc.*

Three-Way Diaphragm Valves

324 Dependable operation and positive sealing at extremely high temperatures are features of a new 3-way, 3-position diaphragm-operated valve available at McEvoy Company. The valve operates on a unique pressure-balancing principle, assuring opening and sealing against inlet pressures up to 5000 psi and closing to differential back pressures up to 3000 psi. Valve has a full "off" position and quickly passes through in diverting the well stream from production to test separator and return. One outlet must fully close before the other can be opened.

Plugs float on stem and align themselves independently in their respective seats for tight sealing. The "off" position feature allows one valve to perform the job formerly requiring 2 valves — diverting and shut-off. The unit will perform the following functions: Automatic sequence well testing; flow line shut-in; stopcocking or intermittent well flow; unloading fluid from gas wells; diverting liquid or gas between 2 outlets where positive shut-off is also required.

Microswitches mounted on the motor diaphragm case may be added to indicate operating positions. Valve is offered in the 2-in. size with all types of end connections and in working pressures from 125 psi to 5000 psi. Pressure of 20 to 30 psi in the 12-in. diaphragm runs the valve even at the highest rated working pressure. *McEvoy Company.*

ANNOUNCING

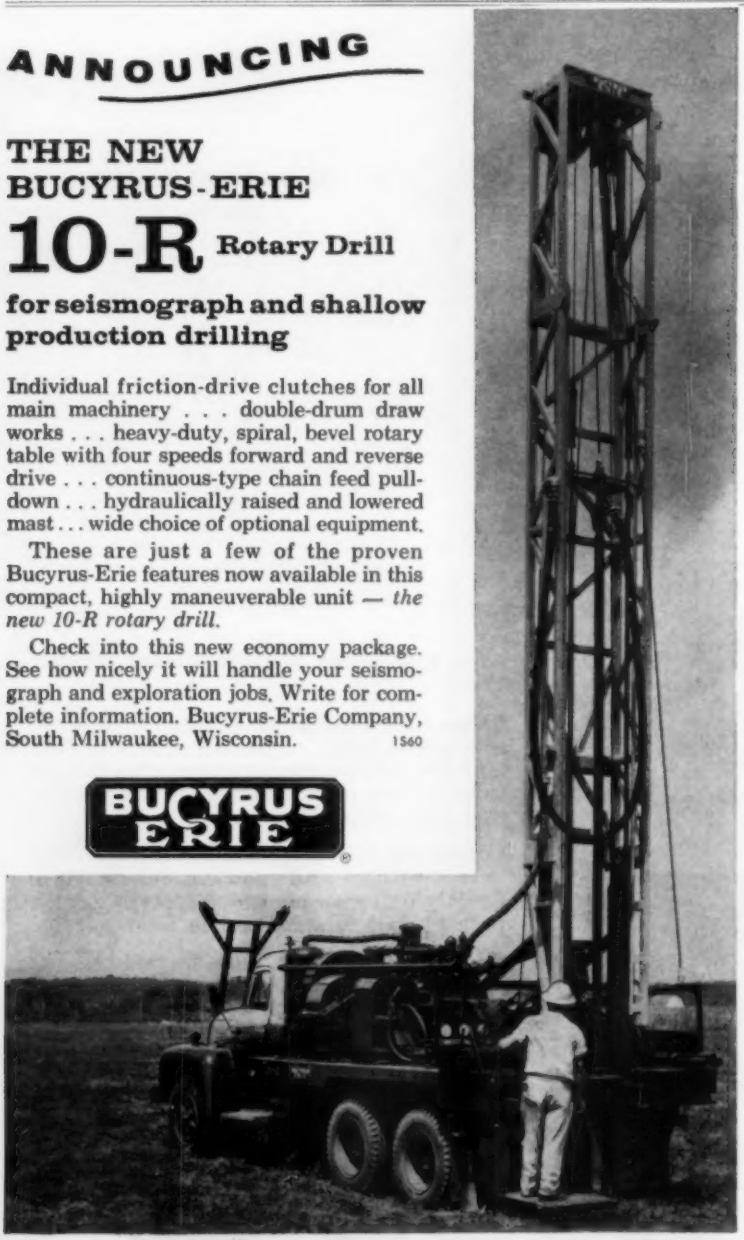
THE NEW
BUCYRUS-ERIE
10-R Rotary Drill
for seismograph and shallow production drilling

Individual friction-drive clutches for all main machinery . . . double-drum draw works . . . heavy-duty, spiral, bevel rotary table with four speeds forward and reverse drive . . . continuous-type chain feed pull-down . . . hydraulically raised and lowered mast . . . wide choice of optional equipment.

These are just a few of the proven Bucyrus-Erie features now available in this compact, highly maneuverable unit — *the new 10-R rotary drill.*

Check into this new economy package. See how nicely it will handle your seismograph and exploration jobs. Write for complete information. Bucyrus-Erie Company, South Milwaukee, Wisconsin. 1560

BUCYRUS ERIE



Adjustable Flow Bean Affords Accurate Control

325 A new "L" type rotary adjustable flow bean, connected to the steel cross in a Christmas tree hook-up, provides accurate adjustable flow control through flow lines. Flow can be adjusted by simply rotating the orifice-carrying disc 60 deg. By installing a blank insert in any of the six orifice positions, positive shut-in can be accomplished by revolving the orifice-carrying disc to place the blank orifice in the line of flow. This eliminates need of wing valve and provides a compact assembly.

Units are available in either screw or flange type connections for 1, 2, or 3-in. hook-ups. Orifice inserts graduate in increments of 1/64 in. and range in sizes from 1/64 to 74/64 in. *Willis Oil Tool Company.*

Remote Control Wireline Oil Saver

326 The Strip-Master hydraulically operated wireline oil saver is manufactured by the Bell Rubber Company. Two models are available: Model HR will pass 1¾-in. rope socket and sinker bar and Model HL will clear 2-in. tubing swab and cups. Packing,

which can be changed in less than a minute, is designed and compounded to take full advantage of the all-around squeeze action principle.

The Strip-Master is easily hooked up for dual operation without special modifications. Adapter with bleed-off connection screws on between 2 units. All working parts are totally enclosed. Thread connections for the Model HR are in 2-in. male or female and 2½-in. male only; for the Model HL, 2-in. and 2½-in. male or female and 3-in. male only. *Bell Rubber Company.*

Line Pressure Seals Through-Conduit Valve

327 Recommended for both Christmas tree and flow line service is a new through-conduit gate valve that features use of line pressure to maintain a tight metal-to-metal seal between floating seats and gate; full-bore, through-conduit design; and positive seal regardless of direction of pressure. Seats of the "Flo-Seal" valve are self-aligning and automatically compensate for distortion from temperature and pressure changes and wear.

After being opened and closed approximately 75 times under test, the valve showed no indications of wear and continued to hold pressure "exceptionally well," the manufacturer stated. In another test, the valve was subjected over a 30-day period to all kinds of abrasive drilling mud, emulsions, and lost circulation materials. For 15 days it was opened and closed as many as 5 times a day, while operating under pressure of 5200 lb. *Alco Products, Inc.*

Wing Unions on Joints and Valves

328 Short nipples and pipe threads, often one of the trouble spots in piping on extra high pressure services such as acidizing, cementing, and fracturing, have been eliminated by the use of Weco wing unions on Chiksan swivel joints and Hamer 2-in. high-pressure plug valves for these services.

The Weco union male and female sub ends are an integral part of the high-pressure joints and valves on which they are used, permitting the joint or valve to be connected directly to a Weco union of the same size and pressure rating. Chiksan swivel joints, styles 50 and 10, in sizes 2 and 2½-in. EUE, and Hamer 2-in. Model DR150W, 15,000 psi valves are now in production and available with the union end connections. *Weil Equipment Manufacturing Corp.*

WISCONSIN-POWERED pump speeds filtration in disposal and water flood projects

This application typifies the adaptability of Wisconsin Engines for oil field jobs. And it proves that now you can enjoy the benefits of trouble-free air-cooled power on jobs in the higher hp range.

The Wisconsin-powered pump meets the need for efficient, low-cost filtration of water prior to injection into sub-surface formations. Used extensively in both disposal and water flood projects, the unit periodically backwashes the filter at a rate of 1160 gpm at 50 ft. tdh.

Like all Wisconsin Engines, the powerful VR4D is custom-engineered for the job. It's a heavy-duty precision-built unit in every detail. It is designed to work better and to last longer. Since it is air-cooled, you can depend on it in sub-zero cold or in 140° F. heat.

Look at the features . . . a 12-volt electric starter for fast, easy starts . . . cut-out switches that automatically protect the engine against damage due to low oil or high temperature conditions. Stellite valves and inserts and valve rotators extend valve life up to 500%.

Specify Wisconsin air-cooled Engines on your utility units. Choice of single-, two-, and V-type four-cylinder models — 3 to 56 hp. Tell us your needs and we will tailor the engine to your machine or job.

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56-HP VR4D ENGINE with clutch take-off assembly, is direct-connected through a flexible coupling to a 5 x 6-R Mission aluminum-bronze centrifugal pump.

J-113

New Diverter Valve Flexible, Economical

329 Operating flexibility and low maintenance are 2 features claimed for a new diverter valve introduced by Garrett Oil Tools. Designated TPOR-1, the diverter is a 3-way, 2-position valve for low pressure automatic well testing systems and other applications where it is necessary to divert flow. It has an 8-in. diaphragm and a large flow capacity with 1.77 sq in. of opening in a standard 2-in. valve. Pressure drop in the valve occurs in the huddling chamber, protecting the seat and disc from cutting action. The bonded soft seat provides a bubble-tight seal that will hold under all working conditions. All inner parts are removable from the top. All exposed parts are of stainless steel. The diverter valve is available in shop fabricated and tested skid mounted headers. *Garrett Oil Tools.*

New Fittings Require No Threading, Grooving

330 A new type of threadless pipe fittings is being distributed by Continental-Emsco Company, which require no special preparation of pipe ends such as threading or grooving, and which can be installed quickly with an ordinary pipe wrench. Designated Type 600, fittings are manufactured by Telsco Industries of shock-resistant, high-tensile malleable iron castings. Design permits use with regular steel, aluminum or thin-wall steel pipe. Modified fittings are furnished for use with plastic pipe. Couplings are long enough to maintain an exact pipe dimension by bridging a gap caused by error in cutting or a split in pipe.

The new series can be applied to tank battery hook-ups, flow lines, salt water disposal systems, pipe repairs, rig fuel and water lines, or temporary and miscellaneous piping. Sizes available are 2 in. and 3 in. Non-shock cold working pressures are 1000 psi for 2 in., and 750 psi for 3 in. Fittings offered are short, long, and extra long couplings. *Continental-Emsco Company.*

Shut-Off Valve

331 A valve that tests both high and low valve-pressure settings without the well being shut-in, the Hi-Lo Safety Shut-off valve, has been developed by Willis.

The design enables the valve to reset itself with live pressure and to work with pressure rather than against it. It offers further economical advantages by eliminating the need for screw-jack resetting and for auxiliary pressure accumulator.

The valve can be easily adapted for automational remote control and for high fluid level shut-off.

Pressures from 35 to 10,000 psi are safely handled due to the valve's rugged construction. Shut-off is accomplished by a pressure-energized piston with special plastic seats. This piston is actuated from an opening in a stainless steel piston valve with insert seats of the same plastic and adjustable pressure control spring. *Willis Oil Tool Company.*

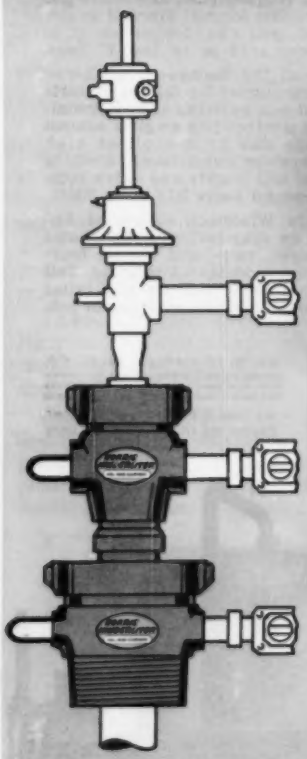
Automatic Vent Valve

332 A corrosion-resistant automatic vent valve for water flood and salt water disposal wells has been developed by Kenneth N. Mills.

The valve is direct acting, with a non-crushable plastic float, synthetic rubber valves, and a clear plastic body.

When installed on a gravity input well, the valve will vent gas from the well, but it will not let air enter. Float-actuated valve prevents back-flow. *Kenneth N. Mills.*

Engineered Simplicity



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Mud Pump Has Automatic Feed and Mixer

333 Automatic feed and mixer on Thompson mud pump recently developed is designed to closely control dry muds and chemicals, except caustic soda, mixed in the mud system.

The pump delivers mud to the system thoroughly mixed, and the manufacturer states that field tests indicate that it has provided an increase in gel yield of 15 to 30 percent over mud mixed by the usual method of hand-feed and jet mixing.

Mud system can be set up and mixed while completing rigup of other equipment, and it can be kept on hand until needed.

The mud and chemical mixer requires no additional pump or outside power, as it is a complete unit. When the hopper is filled and correct feed set, it requires no further attention until it is empty.

Pump design allows obstructing particles to pass, and it is self-sealing without a diaphragm. Since there are no high-pressure jets in the mixer, they cannot cause abrasive cutting action.

Unit's specifications include length, 11 ft 6 in.; height, 6 ft 7 in.; width, 6 ft 4 in.; horsepower required, 36 bhp at 1500 rpm; hopper volume 500 lb bentonite, 1000 lb barites; hopper feed rate, 100 to 3500 lb per hr; and pump volume, 250 gpm. *Thompson Tool Company.*

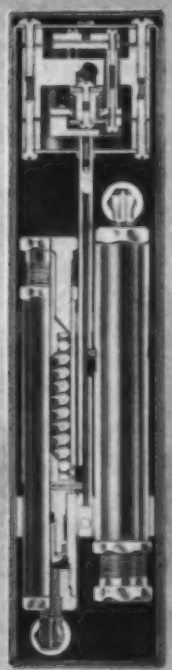
New BOP's Cut Weight in Half

334 Shaffer Tool Works recently developed a new line of blowout preventers which weigh half as much as conventional preventers with the same rating. The units were originally designed for airborne rig operations and have been made available for operators throughout the industry.

Known as Type LWS (Light Weight Steel), the preventers are available in 4 popular sizes: 6-in., Series 900; 6-in., Series 1500; 8-in., Series 900; and 10-in., Series 900. The double 6-in., Series 1500 unit has a 7 1/16-in. bore and 5000 psi working pressure rating (10,000 psi test pressure), yet weighs only 2610 lb compared with 5700 lb for normally-used equipment. The LWS single 10-in., Series 900 unit has an 11-in. bore, a 3000 psi working pressure rating (6000 psi test pressure), and weighs 2100 lb compared with almost 4000 lb for standard equipment.

The new LWS units employ deep-rib casting techniques that give necessary strength without unnecessary bulk. They also incorporate such standard Shaffer features as swinging end-opening doors for easy ram changes, positive in-line ram and piston design, and completely enclosed design with no exposed operating parts. *Shaffer Tool Works.*

MERLA'S NEW
HIGH-LOW PRESSURE CONTROL
(TYPE E-1)



This versatile control is primarily used as a safety control high-low shut-off. The E-1 is also used in well purger, back pressure and pressure reducer service. The Type E-1 offers:

- Two pressure sensing elements to take pressure from two separate points
- Wide pressure range (0-2000 PSI)
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Message Relay Set

335 An all-new automatic message relay set has been announced by Teletype Corporation. The unit is a high capacity, self-contained, punched tape message relaying facility for receiving wire signals at speeds ranging from 60 to 200 words per min, converting them into perforations in paper tape and transmitting them at the same or another speed to local or remote receiving stations.

Model 28 RT sets may be mounted singly or in pairs in a newly designed universal cabinet featuring on-off switches, tape warning lights, and other facilities essential for external control of equipment within the cabinet. *Teletype Corporation.*

Diamond Drill Bits

336 A new, 20-page catalog describing the complete line of diamond drill bits, diamond core heads, core barrels, and contract coring services has been prepared by American Coldset.

The firm's Hillmac Division serves the oil industry in the United States, its Canadian subsidiary, Core Well Ltd., serves the Canadian market.

Special features of this new product catalog include a comprehensive report on recent diamond drilling progress.

Included in the catalog are types of diamond drill bits, including custom designs; types of diamond core heads; price lists; engineering features of core barrels; contract coring services, including equipment rentals and engineering services; manufacturing, engineering and sales facilities; and service locations of the firm around the world. *American Coldset Corporation.*

Dump Valve

337 A dump valve incorporating a piston motor to provide greater power in a more compact package has been introduced by APCO.

The check-stream is engineered to stop leakage by providing a more positive means of shut-off. A solid rubber cylinder, expanded against the body liner by the piston motor, provides leakproof shut-off and eliminates the major cause of dump valve failures.

The piston is opposed by a spring, which closes the valve when the instrument output pressure is zero. The spring drives the valve shaft forward, and the shaft, which operates against the movable spider on the rubber cylinder, causes the spider to move forward. This expands the rubber cylinder against the body liner and effects a fluid-tight shut-off.

Another important feature is throttling action. Whenever the control instruments exert enough air pressure to balance the force of the spring, the piston moves upward. This allows the rubber cylinder to contract and liquid to flow between the cylinder and body liner. *APCO division of Textron, Inc.*

Straightening Vane For Well Flow

338 A well-flow straightening vane designed to correct the turbulence of oil and gas before it enters the tubing has been developed by Petroleum Instruments.

By eliminating a vortex at the bottom of the tubing caused by the swirling action of the formation fluid or gas as it enters the production pipe through perforations, production may be substantially increased.

The vanes are offered in 2 models, both of which are provided with a 2⅜ in. API upset tubing thread for attaching to the bottom joint of tubing.

The standard packer type, for use with conventional production packers, is 4½ in. OD, full opening, and will pass any tools that will pass through the tubing strings.

The other model, which is 2½ in. OD, is for use with insert type packers. *Petroleum Instrument Company.*

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Packer For Tubingless, Conventional Completions

339 New T-I-W Type AH Packer has been designed for use in both conventional and tubingless methods of well completions, where small sizes of casing, production tubing, or both are used.

Designed and manufactured by Texas Iron Works, Houston, this new packer also features one piece mandrel and ring type packing elements, for positive seal against high pressures.

Packer can be set, released, and reset without affecting the efficiency of the packer, and it is available for 2⅜ and 2⅞ OD casing, with or without hydraulic hold-down slips. *Texas Iron Works.*

Slim Hole Tubing Joint Only 2¾-in. OD

340 A new tubing joint with the smallest outside diameter of any threaded and coupled 2⅜-in. external upset tubing has been especially designed for "slim-hole" applications.

The new coupling for 2⅜-in. tubing is machined down to an outside diameter of 2¾ in. This compares with an outside diameter of 3 1/16-in. on standard API threaded and coupled tubing.

J&L engineers say this new coupling offers operators an economical solution to the problem of installing tubing in multiple completion wells with limited clearance.

The slim hole tubing is described as being suitable for use in wells with average pressures. When both pipe and coupling are the same grade, joint efficiency is nearly 100 percent. For greater efficiency, the use of couplings one grade higher than that of the pipe is recommended.

The new tubing is available in Grades H-40, J-55 and N-80. At present, it is being manufactured only in the 2⅜-in. tubing size. *Jones & Laughlin Steel Corporation.*

Production Manifold Three-Way Valve

341 A new 3-way valve, the Many-Flo, was designed by National Tank Company primarily for use on lease well production manifolds.

The valve may be used for mixing 2 different liquids or gases, and as a switching valve to divert flow to different tanks or lines.

Control in any application can be hydraulic, electrical or diaphragm, and it can be sensed by liquid levels, pressure, temperature, times or differentials of these. They can be installed in a horizontal line with diaphragms and valves either vertically or horizontally.

The valves have a working pressure of 600 psi, and are available in 6 basic models. *National Tank Company.*

Magnetic Element For Junk Catcher

342 Globe Oil Tools Company announces a new tool which increases the uses of its junk catcher, making it ideal for standby duty on any rig. The sinker bar and head encompass the standard magnetic element, making it ideal for sandline operation. It is especially well suited to run prior to diamond coring. The thread on the lower end of the sinker bar accommodates the conventional Globe junk catcher head and the box on the upper end is machined to specifications for sandline rope socket.

The new tool permits running: (1) conventional junk catcher barrel with head, and upper and lower dog-type catchers, or; (2) conventional barrel with head, and the magnetic element substituted for the dog-type catchers, or; (3) the same magnetic element with special head (no teeth) on the sinker bar. The tool is sold for export only. *Globe Oil Tools Company.*

Traveling Block Stop

343 A new Wilson traveling block stop automatically stops the block during raising and lowering operations.

It has a worm gear reduction unit connected by a flexible shaft drive to the drum shaft of the rig, and the worm shaft has a cam wheel. Cams can be adjustably clamped in place around the periphery of this wheel. They are arranged to contact a roller on a lever arm, which will engage a valve. When opened, it will shut off either the high or low drum clutch and engage the drum brakes by means of an air cylinder so that the drum will be quickly stopped whether it is going up or down.

When the block reaches either the top or bottom position, the stop operates and the block cannot be moved until a release button is pushed. It is held until the roller rides off the cam wheel. *Wilson Manufacturing Company.*

Jet Perforators

344 The McCullough Mac-Jet Perforator is an expendable, small diameter jet perforator designed to obtain production from thru-tubing and slim hole completion.

Features are an enclosing firing system, minimum debris, and uniform perforation characteristics regarding size, length, and shot density.

Firing system on each unit is self-contained. This includes the set charge and an integrated firing system, enclosed in a frangible, high strength, acid resistant case. When fired, entire perforator shatters into very small pieces which will fall to the bottom of the well and not obstruct subsequent oper-

Side Door Elevators

345 Two new side door elevators for use with Reed Super Connector Drill Collars are available from Web Wilson.

Designated Type HD-50 and Type HD-150, these elevators are furnished in a wide range of drill collar sizes, and in 50-ton and 150-ton capacities respectively.

Field-replaceable drill collar connectors are supported by these elevators at the drill collar recess. Elevator top bore is specially-machined for this purpose, and a larger bottom bore permits freedom of the drill collar OD below the recess.

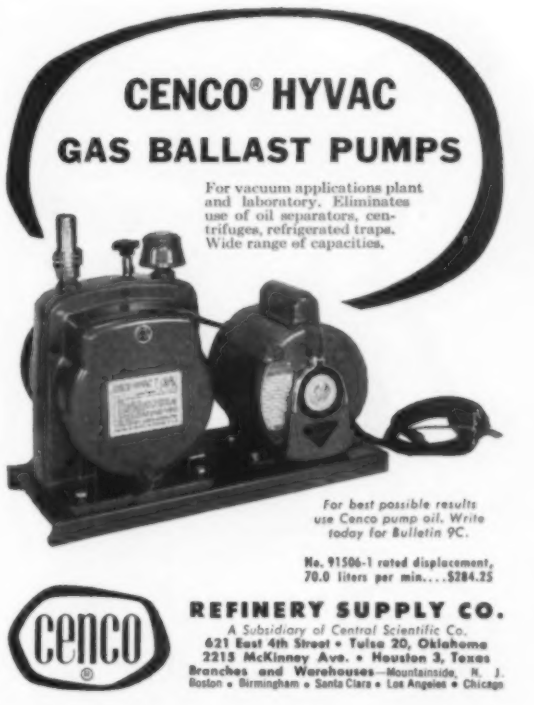
Other features include a patented safety latch that automatically locks when the elevator door is latched. With this door in the open position, the new elevators ride perfectly level. *Web Wilson Oil Tools, Inc.*

Section Mill

346 A new section mill built by Grant Oil Tools was designed exclusively for milling sections of casing in all weights and under all hole conditions, the manufacturer states.

A basic feature of the Body Lock section mill is that the broad bases of the three cutter blades are locked tightly within the tool body during operation. This eliminates the danger of cutter arms bending or breaking off and prevents the blades from being collapsed by side pressure. It also permits the operator to apply greater weights for faster progress.

The mill combines both hydraulic and positive mechanical forces to activate the blades and hold them in maximum operating position. A hydraulically-impelled piston drives the cutters up the inclined planes of the wedge mandrel within the body pockets. *Grant Oil Tool Company.*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ations in the perforated zone.

Gun is designed to give uniform, large perforations, and it is available in 1 11/16 in. and 2 1/16 in. OD sizes. Standard shot density is 4 per ft at 90 deg phasing. Disintegrating spacers are supplied to provide fewer than 4 shots per ft or to blank-off sections when required. *McCullough Tool Company.*

Special Jet Guns

347 Four types of new special purpose jet guns and charges are now offered by Pan Geo Atlas. These are recent additions to the company's complete line of steel-case retrievable guns and expendable tubing-type guns.

The slot-jet perforator produces a hole through the casing approximately ½-in. wide and 3-in. long.

The perforator is an expendable, exposed-type charge containing 72 grams of explosive. It assembles into a gun of 3¾-in. OD and may be fired at 1, 2, or 3 shots per ft.

Two new types of fracture placement or fracture initiating charges also are now offered by PGAC. These charges are designed primarily to provide a large number of perforations on a single horizontal plane to initiate fracturing along that plane. One type, the Frac-Jet, provides eight shots at 45 deg on a single plane. The other type, the Fracture Initiating Charge, provides six parallel perforations, three in each direction on a single plane. Both types are available in diameters for 5-in. and 7-in. casings.

The strip jet perforator has 1 11/16-in. expendable-type swing jet charges mounted in a steel strip carrier. After the gun is fired, the carrier itself is withdrawn from the well. It can be assembled in gun diameters of 3¼-in. or 3-in. OD, with 1 to 4 shots per ft, and gun lengths up to 100 ft may be used on one run in the well. *Pan Geo Atlas Corporation.*

Watch Technique Eases Stuck Pipe Problems

348 Developed by Eastman Oil Well Survey Company to provide an accurate, readable survey while slowly moving the drillpipe up and down is a new short interval single shot instrument watch. Previously, under certain hole conditions, such survey has required elimination of pipe movement to avoid stuck drill pipe. Firm claims when new technique is used, instead of stopping all movement, pipe is moved slowly and smoothly up and down without rotation or circulation during a 45-sec interval. A reliable survey can be recorded if plumb bob and compass in the single shot instrument remain at rest for any 10 to 12-sec interval. Inaccurate surveys are eliminated because readings will be blurred if the angle unit components move excessively. *Eastman Oil Well Survey Company.*

Packer Features Easy Set and Release

349 Brown Oil Tools has introduced the Cam-Lok, a "pipe wrench in a packer" designed to set or release easily when desired. The unit can be used as a weight-set packer, a tension-set packer, a tension tubing anchor, or a tubing catcher, and it is convertible at the well site.

Less than one-quarter turn of the tubing in either direction operates a unique cam mechanism to grip the casing like a pipe wrench working from the inside. This wrench grip, not friction springs or blocks, will lock the packer in place as long as torque is held on the tubing to permit lifting or slack-off of the tubing to set or release the packer. Because there are no wiper springs to wear out while going in and out of the hole and no polished surfaces to damage, redressing the Cam-Lok consists essentially of replacing the rubber seal. *Brown Oil Tools, Inc.*

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Caliper Added To Logging Instrument

350 A caliper attachment has been added to the Geo-Logger. The attachment can be opened or closed at will for quick information on hole size variation at any point of hole penetration.

Applications cover determination of packer seat location, formation correlation, location of cavities, and finding different casing pipe sizes on old wells.

Two arm sizes for the caliper attachment are available. One is from 2 in. to 18 in., and the other is from 2 in. to 36 in. Speed of logging is 50 ft per min.

The compact unit is portable, being mounted on a trailer for transportation to the well site. *Well Reconnaissance, Inc.*

Surge Absorber

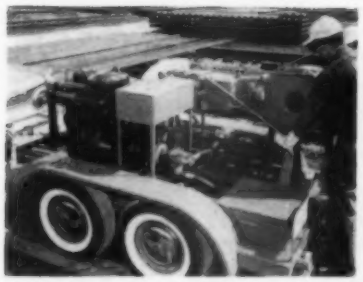
170 Hydril Surge Absorbers are available for application on repressuring and other pressure applications.

Type "K" Surge Absorbers, which absorbs loads caused by fast-closing loading valves, are of the same design used for many years as pulsation dampeners on high pressure oil well mud pumps.

Sturdy, thick-walled steel body, forged steel heads and cast steel valve guard provide maximum protection against possible damage from bumping or rough handling.

Absorber is basically a large-capacity precharged surge chamber which absorbs line fluid under peak pressure loads and exhausts it gently back into the line.

Diaphragm floats on surface of liquid, gas pressure above diaphragm forces it downward to effect complete displacement of fluid through outlet in lower end of the body. Bottom of diaphragm provided with steel insert which is molded and bonded into synthetic rubber to serve as valve when diaphragm reaches bottom of surge chamber. *Hydril Company.*



Portable Buck-On Unit Conserves Time, Money

171 Developed for use in virtually all domestic oil fields is a new self-contained, compact portable buck-on machine equipped with power tongs to remove and replace tubing couplings at the well or in storage yards. Equipment, offered by Hardy-Griffin Engineering Corporation, can handle tubing sizes from 1 through 3½ in., at rate of approximately 2½ joints per min. This means threaded tubing can be supplied at wellsite and couplings applied when needed, or that worn connections can be quickly replaced any time tubing is pulled. Unit can be towed by car or pickup truck to most sites or can be loaded on barges. *Hardy-Griffin Engineering Corporation.*

New Liner Design Features Economy

172 Oil Well Supply Division has added a new Hi-Hard slush pump liner which can be exchanged or re-conditioned. New liner, offered as a running mate for the Hi-Hard piston rod, utilizes latest manufacturing techniques to assure a honed and polished inner surface having a mirror-like finish. The special forging steel used offers properties exactly right for numerous heat treatments. Frequent reconditioning is possible without affecting the quality of the bore hardness. While not in the Di-Hard liner class, the Hi-Hard line is challenging the performance of hardened steel liners and offers economy for normal drilling conditions. *Oil Well Supply Division, United States Steel Corporation.*

Custom-Built Lubes For Heavy-Duty Equipment

173 Announced is a complete new line of custom-built lubricants for heavy-duty equipment, Almasol products, offering great heat, acid, and pressure resistance. The Almasol ingredient is described as a natural mineral complex with a laminar, lattice-type structure that provides slippage or lubrication. Field tests, research studies, and actual industrial usage have proved: load-carrying strength; low coefficient of friction; chemical inertness; a natural affinity for metals; long wear life; and the ability to retain these important characteristics, without change, up to 1900 F. Almasol is used as an additive in lubricating oils and greases, solid lubricants, metalworking fluids, and other special-purpose fluids. Almasol products include: #607 (SAE 90) and #608 (SAE 140) enclosed gear lubricants for mud pumps and chain drives; #1225 crown block lubricant; #1250 extreme temperature lubricant; #185 hydromatic and swivel lubricant; #195 drill collar compound; and #900 tool joint compound. *Lubrication Engineers, Inc.*

Couplings Eliminated In New Tubing Joint

174 A compact tubing joint, in which box and pin threading eliminates couplings, has been marketed by Atlas Pipe, Inc. It meets API specifications, according to the manufacturer. Tubing finished to these specifications starts with plain end pipe. One end of each joint is upset, permitting internal threading to form the joint's box. External threading is used on the other end. Assembled, the two form an

Patent Pending

No-Wall-Stick Drill Collars

effectively reduce sticking of drill collars. . .

Please write Houston office for descriptive brochure and price schedules

No-Wall-Stick Drill Collars

The surface area of these drill collars has been changed to reduce wall contact area by more than 40%. Weight loss of the drill collar is only about 4%. Reduction of 40% in contact area results in a proportionate decrease in the total sticking force due to differential pressure of 40%. This design also gives a section of pressure equalization each foot along the body of the drill collar.

Three sizes (6", 4¾", 4⅛") of NO-WALL-STICK DRILL COLLARS are available on a rental basis in the Texas and Louisiana Gulf Coast area. Rental price of these NO-WALL-STICK DRILL COLLARS is very competitive to conventional drill collars run with stabilizers.

Any new or used drill collars, regardless of size, owned by Drilling Contractors or Oil Companies may be converted to NO-WALL-STICK DRILL COLLARS for a fixed conversion charge.

NO-WALL-STICK DRILL COLLARS offer far more protection from wall sticking in high angle holes or holes which have shale wash outs than drill collar strings using stabilizers.

NO-WALL-STICK DRILL COLLARS will not ball up, will not peel off wall cake, and may be sealed off by a Hydril type blow out preventor at any point.

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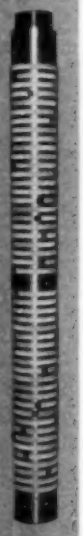

● MARTIN RUBBER & DUCK RINGS give excellent life in dirty abrasive fluids . . . high or low gravity . . . much or little water . . . shallow or deep wells. They last for years in the easier pumping wells. Replacement rings cost comparatively little.

● MARTIN PLUNGER BODIES, precision grooved, drilled and threaded (no underneath fluid passage), usually last for years. Tube or barrel costs are often cut in half.

● The replaceable SYNTHETIC RUBBER GUIDES in MARTIN CAGES last longer than any metal, and the cushioning of the ball increases your ball & seat life. Results are often truly amazing. (Patent No. 2,591,174)

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Manufacturer
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integral joint, eliminating the need for coupling.

The joints are adaptable to wells ranging in depth from shallow to medium. Because of greater clearance made possible by the absence of couplings, the joints have shown good performance in multi-sand completions, where 2 or more tubing strings are run in casing. Tubing is interchangeable with API tubing now in use. *Atlas Pipe, Inc.*

New Tank For Corrosive Applications

175 "Poxyglas"—a new type corrosion-resistant tank — has been introduced. Made by a patented process, "Poxyglas" is an epoxy resin bonded, glass filament-wound tank particularly applicable in the storage of sour crudes, waterflood and salt water disposal processes, and for offshore and other areas where external corrosion is a problem. "Poxyglas" is light in weight and has high strength properties. The tanks are available in sizes up to 12 ft in diam—limited only by transportation restrictions. "Poxyglas" also is non-toxic and odorless, making it readily adaptable for use in storage, distribution, and transportation of corrosive materials and products which must be kept contamination-free. *Black, Sivalls & Bryson, Inc.*

Reversible Pipe Wiper

176 New all-rubber reversible pipe wiper now being offered by Oil States Rubber Company is specially reinforced to provide maximum strength and surface coverage. Reversible feature means up to twice the service time of other wipers. Wipers are ported at the extreme diameter for better drainage, allowing mud to drain. No foreign objects can fall into the hole. Outer ring is of hardened rubber that is bonded to inner ring of flexible, long-lasting rubber. Outside rim is rigid enough to take stress and strain while absorbing any tearing and twisting action. Constant wiping pressure is maintained against pipe for longer period because stretching occurs at tapered outer rim, away from the wiping ring. *Oil States Rubber Company.*

Portable Unit Cleans Oil Field Equipment

177 A new, portable high pressure chemical spray washing system for use on oil field equipment in field or shop has been developed. Called "Thermadraulic," it is basically a specially designed instant heater combined with a 100-gal chemical tank reservoir and a high pressure pump system — propane-fired and mounted on a heavy-duty I-beam skid for field use, and

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The new **JENSEN COMBINATION JACK** is made for rugged duty. Yet combines the best advantages of the Beam-Balanced unit and the Rotary unit. Features longer wearing Ductile iron gears — proven equal to or better than steel.

This **JENSEN COMBINATION JACK** is economical to buy, more economical to operate. Get the complete story by dropping a card or letter to us at Coffeyville.

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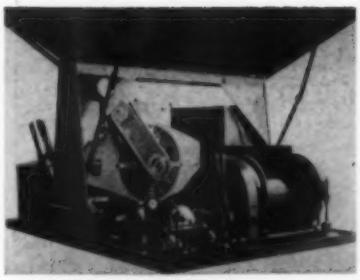
natural-gas-fired and employing a heavy-duty electric motor to power the pump in shop locations. "Thermadraulic" is AGA-approved. One hundred feet of rated 5000-psi burst pressure hose is standard equipment, and units are available with either 200 or 300 psi nozzle pressure.

This heated chemical spray under high pressure has been applied to cutting grease and oil deposits on such equipment as drilling rigs, pulling units, pumping units, tank batteries, and other types of stationary equipment; may also be used to clean rolling stock such as transports, pumpers, and field cars; and is said to be ideal for engine, chassis, and parts cleaning. *Sprayaway Corp. of America.*

Automatic Holiday Detector

178 An automatic wet sponge holiday detector permits higher degree of accuracy and uniformity in checking quality of internal tubular coatings. Power supply is constant and movement of detector lance is uniform. Probe sponge maintains uniform wetness through constant feed of the electrolyte. Pipe is positioned automatically for inspection. Each coated tubing length is inspected by this device for holidays and coating flaws as a final step in quality control. *Tube Kote Inc.*



Measuring Line Reel

179 The new Mathey "Gulf Coast Special" reel features a redesigned controls system for greater accessibility and versatility. Combined with the standard features, these features provide a reel of greater efficiency, designed specially for offshore work. It is skid-mounted, lightweight, and is equipped with a corrosion protection cover. Power unit, drives, and controls are available to specification. *C. A. Mathey Machine Works, Inc.*

Chromatographic Gas Analyzer

180 A new "H.F.I." gas analyzer has been announced by the Well Logging Equipment Manufacturing Company as an instrument for the field or the laboratory. The analyzer furnishes a fast and accurate chromatographic analysis of hydrocarbon gases with the complete analysis through pentane being recorded in 5 min. It features very high sensitivity (5 to 10 ppm of hydrocarbons in an air sample produces usable peaks) with 7 scales of attenuation from 1 to 1000.

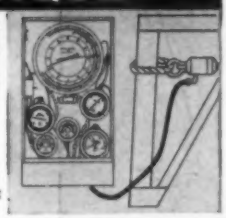
No air peak is recorded, as air is the carrier. A sample valve and hypo injection means of sampling is provided and the low volume hydrogen requirement is self-generated and self-consumed as used. *Well Logging Equipment Manufacturing Company.*

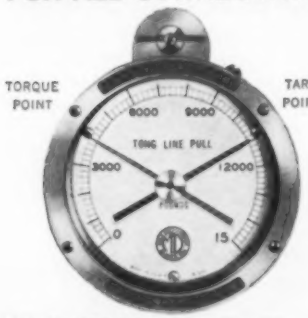
Break-In Dressing

181 Now being offered by Jet-Lube Inc. is a new #20 Moly-Spray, a quick-drying vehicle for pre-dressing drill collar tool joints prior to initial break-in. Containing 20 percent by weight of micro-fine molybdenum disulfide, lubricant can be brushed on new or recut joints or may be sprayed on, using regular paint spray equipment. It "touches dry" and sets up firm in a matter of minutes, preventing dust adherence. The #20 Moly-Spray forms a smooth, adhering coating of molybdenum disulfide powder over which a conventional drill collar compound can be readily applied. This prevents seizure, gall, and tear. *Jet-Lube Inc.*

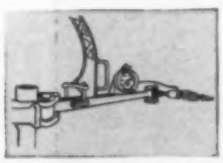
TONG TORQUE

THE MARTIN-DECKER TONG TORQUE ASSEMBLY FOR ALL CONNECTIONS





PERMANENT INSTALLATION The cylinder attached to the back-up line provides torque indication each time collars are run.



PORTABLE INSTALLATION The torque assembly attached to the tong itself can be used for spot checks on two or more rigs.

ONE GAUGE for torque measurements of all size drill collars, drill pipe, tubing and casing.

ACCURATE AND RELIABLE readings with calibration checks seldom required.

CARE AND MAINTENANCE can be capably done by the drilling crews.

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- Completely automatic
- Calibrated holding power
- No bleeder valve required
- Large by-pass area
- O-ring fluid seal
- Simple construction, minimum maintenance
- Installed above pump; automatically "sets," holding tubing in natural tension
- No drag on casing going in hole or coming out unless tubing is pulled "wet"
- Can safely be installed in perforated pipe

Compensates both up and down

Complete range of sizes for 4½" to 11¾" API Casing. Write for complete information.

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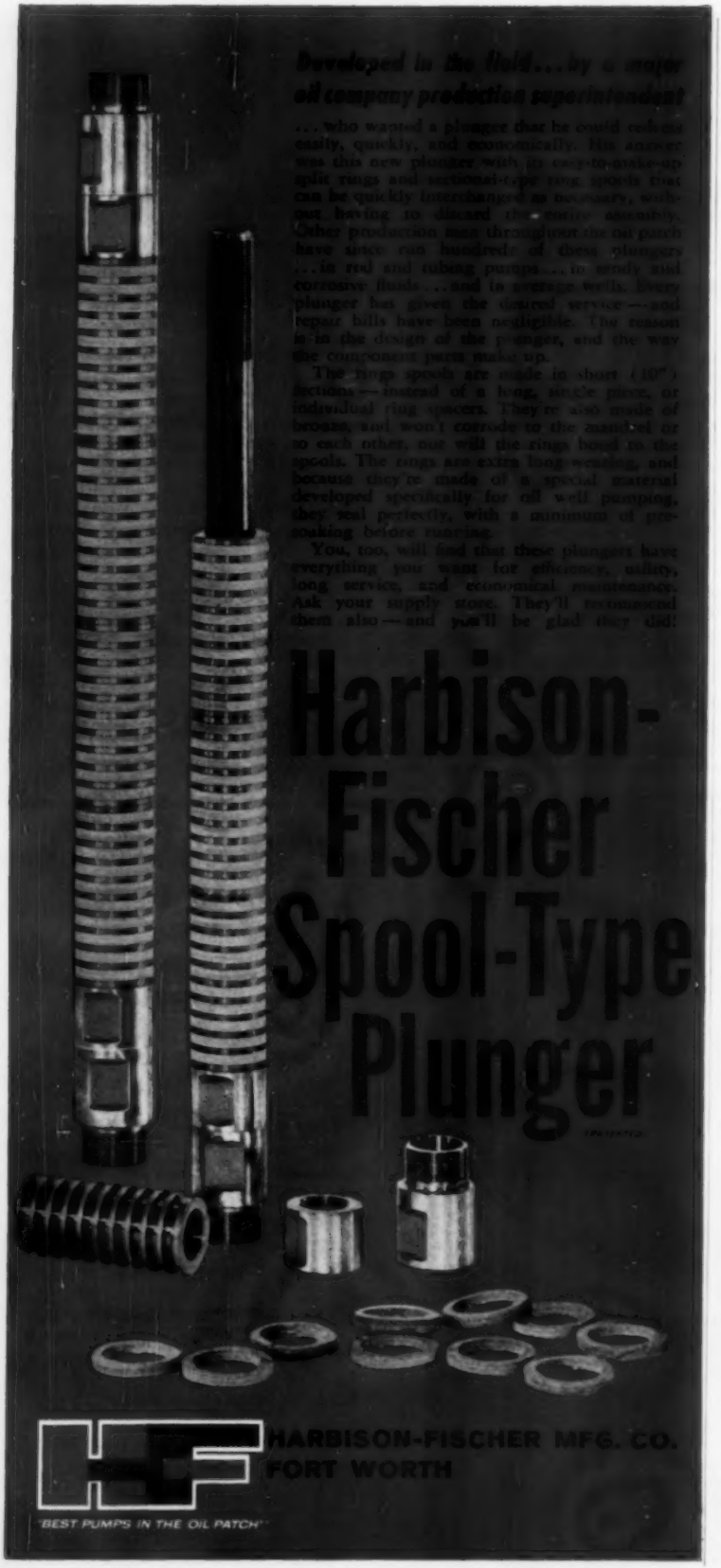

Developed in the field... by a major oil company production superintendent
...who wanted a plunger that he could redress easily, quickly, and economically. His answer was this new plunger with its easy-to-make-up split rings and sectional-type ring spools that can be quickly interchanged as necessary, without having to discard the entire assembly. Other production men throughout the oil patch have since run hundreds of these plungers ...in rod and tubing pumps ...in sandy and corrosive fluids ...and in average wells. Every plunger has given the desired service — and repair bills have been negligible. The reason is in the design of the plunger, and the way the components parts make up.
The rings spools are made in short (10") sections — instead of a long, single piece, or individual ring spacers. They're also made of bronze, and won't corrode to the mandrel or to each other, nor will the rings bond to the spools. The rings are extra long-wearing, and because they're made of a special material developed specifically for oil well pumping, they seal perfectly, with a minimum of pre-soaking before running.
You, too, will find that these plungers have everything you want for efficiency, utility, long service, and economical maintenance. Ask your supply store. They'll recommend them also — and you'll be glad they did!
Harbison-Fischer Spool-Type Plunger
HARBISON-FISCHER MFG. CO.
FORT WORTH
"BEST PUMPS IN THE OIL PATCH"

New Rheometer Accurate Self-Contained Unit

182 Developed specifically for field testing the rheological properties of drilling fluids at two rotational shear rates is the new Baroid rheometer. Operation is easy, quick, accurate. Unit is powered by a hand crank that drives rotor at pre-selected speeds through precision gear train and governor. Rotor speeds of 300 or 600 rpm are obtained by appropriate speed control lever settings. Third setting operates rotor at higher speed for stirring drilling fluid sample. Deflection scale shows gel strength measurement. No electrical power is used and all working parts are oiled for the life of the lightweight instrument. *Baroid Division.*

Electric Heating Centrifuge

183 A new lighter and more compact heating centrifuge has been designed by L-K Pump Valve Company featuring a specially designed motor and cast aluminum case. No plumbing is required and car engine need not be running to keep unit functioning. This streamlined model takes up a minimum of space and is easily installed or moved. Since heat in the cups is controlled by a 2-stage resistor switch, outside temperature has no effect on operation. *L-K Pump Valve Company.*

AMALOG Cuts Costs In Checking Pipe

184 New electronic method of inspecting oil tubular goods is AMALOG, now being used at Tuboscope Company's inspection plant at Walker's Mill, Pa. Technique is designed to locate significant internal and external seams, overlaps, slugs, rollins, and other discontinuities in new casing, tubing and drillpipe. It will also detect tube wall eccentricity and laminations not outwardly obvious. Savings of up to 20 percent are claimed in tubular inspection costs, and defects are found near the manufacture site, eliminating expensive refreighting of defective material. *Tuboscope Company.*

Motor Control Centers

185 Motor control centers, used to control electrical loads such as motors, lighting, welding, and heating, are now available with bus capacity from 200 to 2000 amp for voltages from 110 to 600. Available either as fusible or circuit breaker combination units, the control centers consist of two or more starters fed from a common bus and are often attached to transformers or switchgear to form a unit substation. Substations are available as a complete package or as individual units. All control compartments of like size are interchangeable anywhere in the control panel. Control center features include: plug-in design, permitting easy moves from one location to another; only one main circuit breaker for one center; centralized arrangement, permitting easy maintenance; mechanical interlocks on each door which shut off current when door to cubicle is open; and two doors for dual-mounted breakers, permitting one breaker to be serviced without interruption to the other. *Allis-Chalmers Mfg. Co.*

Compact Compressors Provide Economical Air

187 Compact motor-driven reciprocating compressors for industrial air—that can be operated completely unattended with the manufacturer's "En-Tronic" controls are being offered to fulfill a wide variety of requirements. Ratings of 120 to 500 hp with capacities ranging from 698 to 2005 cu ft per min at pressures from 110 to 500 psi make these DMR series compressors favorable in providing air for uses ranging from shop air supply to soot blowers. They also are adaptable for use in compressing other gases for a variety of services other than air supply. Compactness permits installation in existing space. "En-Tronic" controls are to permit automatic loading or unloading the compressor as pressure requirements dictate. *The Cooper-Bessemer Corp.*

New Gas Line Heater Reduces Corrosion

188 A new, indirect action gas line heater, in which a bed of aluminum pellets is heated by a burner, radiating heat evenly to the heavy-wall steel circulation tubes, is available at Merla Tool Corporation. Absence of water reduces corrosion and eliminates damage resulting when water is boiled away. Maximum and minimum temperature controls shut off gas in the event of line leaks or pilot failures. Two-stage pressure regulation takes burner gas from the main line through filter drip pot. Fuel economy is assured by a heavily-insulated jacket.

Heater capacity is 50,000 Btu per hr; working pressure is 1500 psi at 700 F. This heater may be installed in any 2-in. by 5-in. level area or directly on level ground. *Merla Tool Corporation.*

Operating Company Goes Into Production Of Instruments for Wide Industry Use

186 So much interest has been expressed in a number of instruments developed by United Gas Corporation as time and money savers in its own operations that the company has formed a new division to manufacture and market them on a nationwide basis.

Announcement of the establishment of UGC Instruments Division was made by Ed Parkes, president.

D. T. MacRoberts, United's director of research, will head the new instruments division that will turn out:

Pipeline Calipers. These instruments will be designed to operate in pipelines up to 36-in. in diam.

Automatic Relighter. These are designed for oil and gas field heaters.

Improved Dew-Point Detector.

Electronic Chart Reader. Since large volumes of gas are measured with orifice meters that are not direct reading meters but record on a chart only the basic data from which the volume can be calculated, the electronic chart reader will be produced to scan the chart, make necessary calculations, and record the result on a dial and on tape using only one person to feed the charts and enter meter numbers. All other data is stored in the computer.

Linear Chart Averager. Now in production, this instrument continuously averages temperature, gravity, or pressure charts. One operator handles the entire job, without comptometers or adding machines. This instrument will be available for practically any circular chart — temperature, pressure, specific gravity, flow rate, and others.

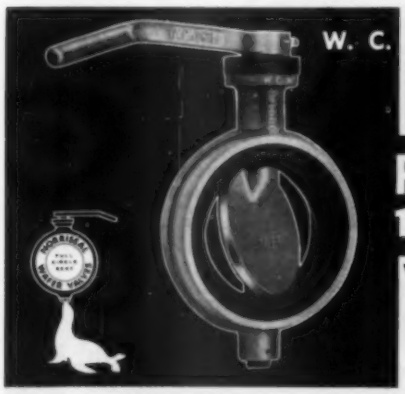
Miniature Tape Recorder. The major applications of this instrument will be in stock control, production accounting, point-of-sale recording, and inventory work, although it was primarily developed for use with domestic meters of utility companies, to reduce all manual operations, figure-handling by different individuals, and speed up accounting work. *UGC Instruments Div., United Gas Corp.*

D.A.B. DE-ACTIVATE BENTONITE

A new chemical additive for water to **permanently** de-activate the swelling of Bentonitic shales and clays. **D.A.B.** controls and limits the amount of water associated with clay swelling. Compatible with all acids and surfactants for the following uses:

1. Oil Well Stimulation and well washing.
2. **Inorganic or organic acid jobs.**
3. Wash — to remove swollen clays — to release water block.
4. **Mud-cake removal.**
5. Completion fluid in conjunction with clay base or oil emulsion muds.
6. **Ordinary clay base drilling mud.**
7. Fracing.
8. **Advance water flood procedure.**
9. Cementing, etc. — whenever it is desired that filtration or encroachment of water **will not** have a harmful effect on Bentonitic shales or clays.

SIEVERS, INC. 1539 Harbor Ave., Long Beach 13, Calif. Long Beach HEmlock 7-3591 Los Angeles SPruce 5-2891



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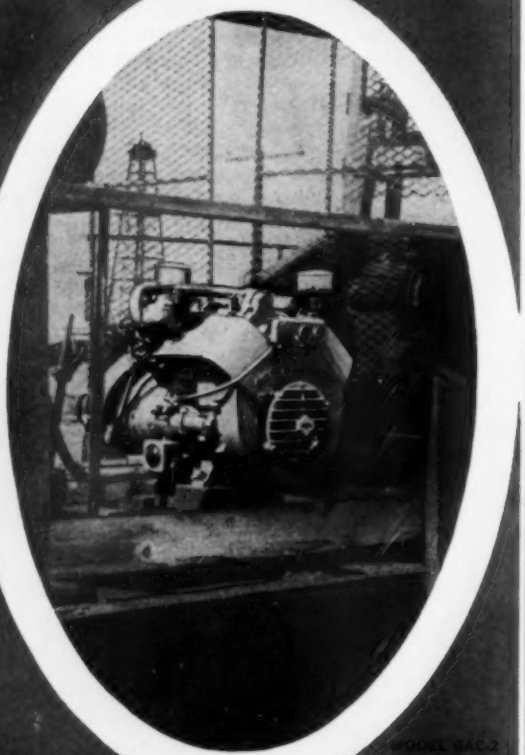
NATURAL GAS ENGINES



MODEL GAC-2 pumping a ... hollow oil well

American MARC, air-cooled Natural Gas Engines have the same heavy-duty construction as American MARC diesel engines. Consequently, they deliver exceptionally long service with minimum maintenance and attention. For offshore operations or operations without available electric power investigate American MARC Natural Gas or diesel-powered generator sets. Built for positive dependability.

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GYP and SCALE TREATMENT GS-20 ... Effective on these types of carbonates and sulphates: calcium, strontium, barium and magnesium.

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MODERN INDUSTRY EQUIPMENT

Engine Burns Jet Fuel or Cleaning Fluid

101 A new engine which runs on high or low test gasoline, diesel oil, kerosine, jet fuels, or even cleaning fluid is being introduced to the U. S. by England's Rootes Motors. Main significance of the engine is that it will allow utilization of the most economical fuel available in any given area, particularly important when vehicles or machines are used in remote areas. Multi-fuel feature depends on a special type of variable pressure fuel injection system which varies the amount of fuel fed into the combustion chambers depending on the fuel used.

The basic engine, a 2-cycle, 3-cylinder unit, is designed to deliver 105 bhp. Variations in design allow 75 and 85 hp ratings as well. *Rootes Motors, Inc.*

LPG Carburetor System

102 A new LPG carburetion system from Ensign Carburetor Company is designed specifically for small engine applications. The compact, simplified design is free from springs, valve levers, pivot pins, and partition plates. Electrical control provides instant flow of gas for starting without choking or priming and automatic shutting off of gas when the engine stops. Interchangeable venturi of different sizes permit accurate tailoring to the engine.

A kit containing all necessary hose, fittings, electrical cable and terminals, etc., is available as optional equipment to facilitate installation. *Ensign Carburetor Company.*

High-Altitude Helicopter

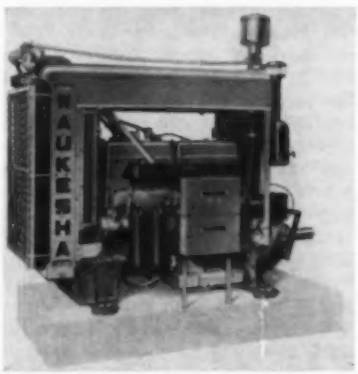
103 Bell Helicopter Corporation's 47G-3, which last fall set new altitude records, is a version of Bell's 47 series, most widely-used commercial helicopter in the world. The model is powered by a new Franklin turbosupercharged engine and incorporates a larger, proven rotor system borrowed from Bell's 47J Ranger.

Carrying a useful load of 1011 lb, the 47G-3 has a service ceiling of 23,000 ft plus, a maximum cruise speed at sea level of 105 mph, and a maximum range of 236 miles. Rate of climb is approximately 700 ft per min at 15,000 ft altitude. *Bell Helicopter Corporation.*

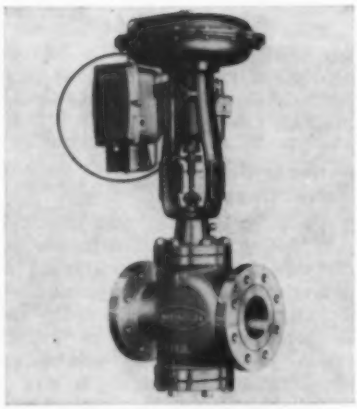
Engine Control System

104 Introduced is a new system for controlling engine operating periods and load engagement or disengagement. These may be of preset (time cycle) duration or controlled manually; or of predetermined variable periods governed by mechanical devices or electronic (radio) impulse; or by maximum or minimum load limits. Any combination of downtime and operating time can be monitored closely.

The control panel contains all devices for automatic starting with inter-



mittent cranking periods, controlled warm-up, positive clutch control (with provision for initial counterweight swing reversal to start pumping in beam-type applications), variable operating time at governed speed, clutch disengagement, and engine shut-down for variable timed intervals. Operation is independent of outside power except for impulses received when operated by remote control. Functioning with engines using all standard fuels, the Engomatic power control system has safety shut-down devices, visual indicators, manual resets, and protective cast metal housing. *Waukesha Motor Co.*



New E/P Positioner

105 A new electropneumatic positioner that permits combining the advantages of electronic controllers and the power and smooth throttling action of pneumatic control valves has been developed. Directly comparing valve stem position with controller output signal, the Model 8010 positioner employs an extra large, stabilized, magnetic force motor to supply high force changes and a high-capacity air relay for fast stroking speed. The electrical circuit is adaptable to all presently available electronic controllers.

Model 8010 is available for 3 through 15 psi or 6 through 30 psi valve spring ranges, or for split ranging. Standard stroke ranges are from ⅜ to 3 in. and from 2 to 4 in. It may be used with either direct or reverse actuators. *Mason-Neilan, Div. of Worthington Corp.*

Solvent Alkali Cleaner Removes Tough Deposits

106 A new solvent alkali emulsion cleaner designed specifically to remove tough carbon and asphalt-bearing soils from processing equipment is offered by Oakite Products, Inc. Solution is generally used by circulating through closed system in water mixture at 12 to 16 ounces per gal at temperatures up to 210 F, followed by hot water rinse. Designated Oakite 79, solutions have pH of 13.5 to 14; safe on brass or steel but not recommended for use on zinc, aluminum, or magnesium. *Oakite Products, Inc.*

Smog Control Automotive Muffler

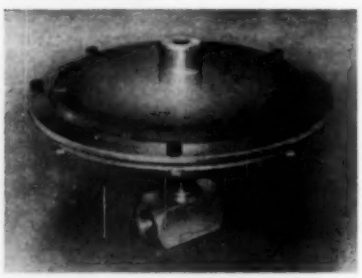
107 New Purzaust muffler developed to comply with the recently-passed California law making smog-control devices mandatory, is designed for original installation in new autos or replacement in older cars. The muffler is 17 in. in diam and 4-in. thick and contains a catalyst to convert smog-causing components of automotive exhaust into non-irritating compounds.

Road tests have shown it will function efficiently for a year of average driving (10,000 to 12,000 miles) without catalyst replacement. *Universal Oil Products Company.*

Hammer-Driven Valve Operator

108 Roto Hammer is an effective mechanical method for the initial unseating and final seating action of a valve in any heat or pressure service. The unit's rotary hammer and anvil components transfer an impact action to the elevating mechanism which actuates the valve. The unit is bolted or clamped to the existing valve handwheel or the handwheel may be replaced with an adapter where desirable. Roto Hammer is made in 4 stock sizes to handle any valve from 2-in. through 16-in., and special sizes for larger valves are readily available. The units are available in both hand and chain-operated models. *Roto Hammer Company.*

Remote Control Needle Valve



109 A new high pressure remote control needle valve has been developed by Dragon Engineering Company. Designated Model 4888, the valve has a conventional needle type stem coupled directly to a pneumatically operated diaphragm mounted on the valve body, producing an overall height of only 5 in.

Designed for high pressure service, the ratio of line pressure to control is in excess of 200:1, giving it an operating pressure of 10,000 psi with less than 50 psi control pressure. Conventional methods of control are used: an electrically operated solenoid valve for straight open and close, or an electrically operated solenoid valve with a low pressure regulator for metering and pressure relief applications. The valve is available in sizes ⅛ through ½-in. npt as well as AND 10050 tube sizes 4 through 8. *Dragon Engineering Company, Inc.*

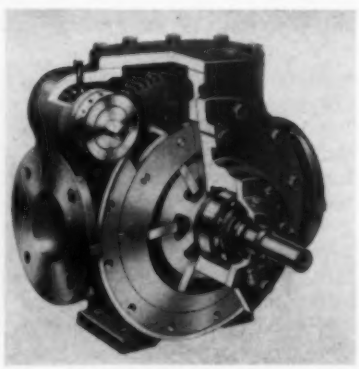
Silencers for Turbo-Charged Engines

110 The Universal Silencer Corporation's Model UT silencer is a straight-through design which specifically meets the low pressure drop and high silencing requirements of the manufacturers of 2-cycle turbo-charged engines. The straight-through design feature imposes no more pressure drop in the exhaust system than an equal length of straight pipe.

Featuring heavy-duty, all-welded, explosion-resistant construction, the silencers have flanges matching 125-lb diameter and drilling in all sizes. Outlet tail pipe up to 3 pipe diameters long are furnished in lieu of outlet flange at no extra cost. Inspection openings and mounting brackets are available on all sizes. *Universal Silencer Corporation.*

Variable-Flow Pumps Need No Speed Change

111 A new variable-capacity rotary pump is offered that can be powered with any standard-speed motor, because it is possible to "dial" instantly any desired flow rate from zero to full capacity without changing the pump speed. The Vari-Flo's dial operates a pinion and rack that rotates an eccentric liner to change the effective displacement of the pump. A simple turn of the dial also will reverse flow while in operation. This unique feature permits evacuation of discharge lines when desirable without additional bypass piping and valves. Now in 2, 3, and 4-in. sizes with capacities up to 450 gal per min, Vari-Flo pumps are applicable: where a change in flow rate is required to meet varying delivery conditions, varying liquid condition, and in liquid proportioning. *Blackmer Pump Co.*

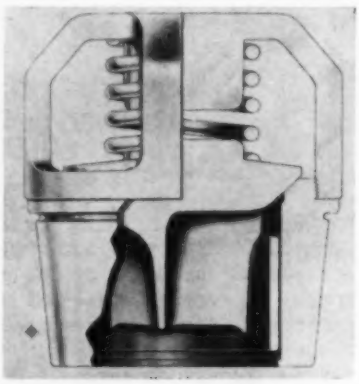


More Engraving Area On Annunciator Nameplate

112 Now optionally available at no extra charge on Scam Instrument Corporation De-Line annunciators is a new nameplate that permits 70 percent more engraving area so that engineers may more fully describe condition variations monitored by the system or employ larger characters more easily readable at greater distances. The Magna-Plac is 3¾ in. by 3⅜ in. overall, of which 3⅜ in. by 3⅛ in. is useable engraving area. No more panel space is required. The elimination of a metal frame around the white translucent acrylic cover provides the added area. The permanently hinged, heavily molded one-piece plastic cover, which will not chip or discolor, is locked with a captive thumb screw. *Scam Instrument Co.*

Vertical, Horizontal Plunger Pump Valve

113 A metal valve with 45-deg metal-to-metal seats has been introduced for corrosive service where pressure does not exceed 5000 psi, such as in waterflooding, sour crude gathering lines, acid transfer pumps, high-



paraffin-content crude handling, salt water disposal, and chemical transfer pumps. The self-cleaning FP-8C "Tru-Lift" valve features "soft action" opening and closing and straight line motion with the largest total valve guiding area, according to the manufacturer. Vanes cast within the valve body rotate the valve and direct fluid flow to the large circumferential openings for rapid movement of large volumes, suiting the valve for pumps with low suction pressures. This valve is furnished complete with valve seat, valve body, spring retaining cage, and springs; in standard materials of 18-8 type stainless steel and aluminum bronze; and in other materials for special services. *Dixell Development & Manufacturing Co.*

Bonnet Valves Are Inside Screw-Bolted

114 Two new valves have been announced in gate and globe types for 150 to 800 psi service. They are of the inside screw stem, screw gland, bolted bonnet type, with screw ends or socket weld ends in ¼ through 2-in. sizes. Bodies are forged steel. Gate valve seats are expanded in the body and easily renewable. Stellite or equivalent hard facing alloys are welded to the 13 percent chrome stainless steel seats, and other trims are available. Wedges are 13 percent chrome stainless steel hardened to 500 Brinell for maximum resistance to wear and erosion. Globe valves have hard faced integral seats and hardened discs. Stems are 13 percent chrome stainless steel. Deep stuffing boxes have one-piece forged steel packing glands. Bonnet studs are high-tensile alloy steel. *Henry Vogt Machine Co.*

Strainers Feature Magnetic Separator

115 Nugent full-flow lube oil filters, simplex or duplex, have capacities to equal engine lube oil pump capacities. Cellulose disc-type filters provide a high flow rate at low pressure drop to give the extreme fine filtering, absorption, and neutralization properties of a depth-type filter.

Strong alnico magnets remove minute ferrous particles not caught in the strainer basket. Available in brass, cast iron, steel, or stainless steel, the strainers may be furnished with electrical contacts to operate a warning bell or light should liquid flow cease. *Wm. A. Nugent & Co., Inc.*

Flexible Shaft Assemblies

116 The F. W. Stewart Corporation has announced new standard flexible shaft assemblies manufactured in over 180 variations and offered in 4 different cable sizes: 0.130, 0.150, 0.187, and 0.250 in. The shafts are offered with either mono-directional type cable for motor-driven or high-speed applications, and bi-directional type cable used basically for hand-operated control applications. Each type of standard assembly can be furnished with 3 to 4 end fitting combinations on either end of the shaft assembly. *F. W. Stewart Corp.*

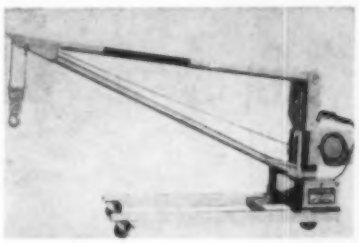
Continuous Or Standby 2 KW Electric Plant

117 A new, lightweight, compact 2-kw electric plant powered by a Kohler K241 air-cooled engine has been introduced in models for automatic, remote, or manual starting and for gasoline or combination gas-gasoline operation. The single-cylinder, 4-cycle engine of large bore, short stroke design has ample horsepower (5.6 hp at 1800 rpm) for the rated 2-kw output and for intermittent overloads up to 2.5 kw, and features automatic spark advance and anti-friction ball bearings at both ends of the crankshaft.

Single-phase generator supplies 60-cycle a-c current at 115 or 115-230 v. Vibro mounts, skid-type base, fuel pump, sediment bowl, fuel filter, oil bath air cleaner, and muffler are standard equipment. Reverse cooling, weatherproof housing, and other accessories will be offered. *Kohler Co.*

Dolly With 9-Ft Boom, Battery-Powered

118 The new POX-LD Auto Crane dolly unit — featuring combination of battery-powered hoist and 9 ft boom and operated by simple push-button controls — may be used for precision spotting, such as positioning



work, and other material handling jobs requiring a high degree of control. Batteries are recharged overnight (charger optional). All casters on the dolly swivel 360 deg, even under heaviest loads, for high maneuverability. The units are available in six models for use with light to 3000-lb loads and for vehicle, dolly, or stationary use. *Auto Crane Co.*

Low Temperature, High Humidity Zinc Coating

119 Designed to provide a high degree of galvanic protection and to eliminate sub-film rusting in salt water, fresh water, and solvent environment is a new, rapid-drying, all-inorganic zinc coating called Carbo Zinc #11. Applicable by brush, spray, or roller, in 90-100 percent humidities and at temperatures as low as minus 20 F, it can be used as a single coat protection or as a prime coat for other organic and inorganic topcoats, is effective at temperatures of minus 80 F to plus 750 F, and becomes water insoluble after 20 min. This property is something new in protective coatings and is said to be most highly desirable for coastal areas. *Carboline Co.*

Automatic Preparation Of Joints For Welding

120 Increase in automatic welding has produced a need for automatic joint preparation and the new Model Q-3 completely-mechanized automatic Arcair torch fills that need and eliminates moving work to burning slab or planer. The unit consists of a head with an electrode feed mechanism that feeds consumable copper-coated carbon-graphite electrodes as required and supplies a jet of compressed air at proper location to blow away molten metal. The head is mounted on a tractor permitting straight line or circular travel at pre-determined speed ranging from 0 through 180 in. per min and can be removed from the tractor and mounted on the positioning equipment. The head can be set at any angle with the work to produce a variety of grooves and bevel contours. *Arcair Company.*

Butterfly Valve Has Rubber Seat

121 The Monoflange Mark II is a rubber seated (Hycar or Goodyear Chemigum nitrile rubber) butterfly valve for pressures to 150 psi and temperatures to 200 F. Featuring completely bubble-tight shut-off and ideal throttling characteristics, this valve is finding increasing use where space, leakage, premature wear, etc. are problems.

This type of valve requires far less operating force than metal-to-metal seat valves and requires only ¼ turn for complete opening or closing. Furnished with a variety of manual or automatic operators. *Henry Pratt Company.*

High Volume Filtration

122 Krauss-Maffei-Imperial, Munchen, Germany, are designers and manufacturers of solids/liquids separation equipment from filters through centrifuges to dryers and from combined groups of these to complete plants. In the fields of mechanical and thermal separation and their combinations, the company has world wide experience extending over many years. Experts in separation techniques as well as special pilot plant facilities are available for determining the most adequate separation procedure to be followed in every case. *Krauss-Maffei-Imperial.*

Circle corresponding numbers on Reader Service Card for more information from the manufacturer.

HEAVIER OUTSIDE WIRES mean great resistance to abrasion. FINER INSIDE WIRES mean excellent drum winding characteristics.

In REGULAR LAY ropes the wires are laid in a direction opposite to the lay of the strands. This provides stability even under severe operating conditions.

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are now being manufactured in England, Italy and France to assure availability of these proven pipeline valves throughout the world. Grove G-4 Gate Valves feature proven double-action sealing: a primary metal-to-metal seal backed up by protected o-rings to assure a positive bubble-tight closure. Another major advantage—Grove G-4 Valves never need lubrication. Dependability has made Grove G-4 the most popular "Big" Gate Valve in use today. Please address inquiries for technical data to Grove France S. A.

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Balanced Loading Assemblies Line

123 The complete line of Oilco loading assemblies is crafted in many variations and models to fulfill diversified requirements; some with counter weights, some spring balanced, some hydraulic, and some mechanical. Sizes 2, 2½, 3, and 4 in. are available. The new No. 460-M loader is spring balanced with compression type springs and has a cam design which permits vertical travel arc of 130 deg. Springs are adjustable to meet varying loading conditions and may be adjusted upright to 85 deg. Arm may be lowered to loading position without holding down manually.

A large extension has been added to the company's manufacturing, storage, and shipping departments. *Oil Equipment Manufacturing Company.*

Digital-Sequential Annunciator System

124 In interlocked processes where automatic equipment is provided with shutdown devices, the Panalarm "50" digital-sequential annunciator system performs an essential function of pinpointing trouble. In many shutdowns, the cause of trouble is difficult to locate and may require many hours in checking circuits and equipment to locate the original source of trouble. The annunciator system provides a solution to this problem by giving an immediate visual and digital indication of the cause of shutdown or otherwise "off-normal" condition by identifying sequentially the off-normals which occur in a group of alarms.

Visual indication includes not only the standard backlighted nameplate or bullseye for point identification, but also binary readout lamps to show the first and subsequent alarms in the order of occurrence. *Panellit, Inc.*

All-Wheel Drive Dozer

125 Announced is a new Detroit Model 44-35 all-wheel drive bulldozer featuring a 49-hp gasoline or diesel engine, planetary steering, and controlled traction. It has been designed to give the operator full visibility of his work. An all-welded frame gives a low center of gravity, yet a full 20 in. of clearance. Positive up and down hydraulics, coupled with bulldozer blade 72½ in. in width and 30 in. in height and inside push arms, are said to allow precision work with ease. It has four forward and four reverse speeds ranging from 1 through 8.7 mph at 1450 rpm and a road speed of 17 mph at 2000 rpm. *Detroit Tractor Ltd.*

Modular, Solid-State Data Processing System

126 A completely modular, general purpose, solid-state data processing system has been developed that is capable of 45,000 floating point operations per sec and has a maximum input/output rate of 300,000 digits per sec. The Bendix G-20 system may include magnetic tape units that read and write at 120,000 digits per sec, punched card input/output equipment, punched paper tape input/output, line printers that operate at 600 lines per min, as well as remote sub-systems that can communicate directly or indirectly with the main computer.

Control buffer units are a key feature of larger G-20 systems. They provide data editing, code translating and input/output control facilities independently of the central processor, thus freeing it from routine data handling tasks. The compact system's central processor is 66 in. wide, 60 in. high, and 28 in. deep. *Bendix Computer, Div. of Bendix Aviation Corp.*

Turbine-Type Meter Can Handle Liquids of Varying Viscosities

127 Marking a break-through in metering technology is the Turbo-Meter, a new liquid meter that operates on the same principle as the turbine used in a power plant or turboprop jet. For use in pipelines handling both crude and products, it can measure flow rates as high as 15,000 bbl of liquid per hr; is accurate within 15 parts in 10,000 and will maintain its repeatability within one part in 10,000; is ⅛ the weight of comparable capacity positive displacement meters; and can handle a variety of liquids in consecutive order without requiring any calibration or adjustment. The Turbo-Meter attains its accuracy as a result of the turbo-rotor blade configuration, a special device called a viscosity compensator, and a magnetic type of coupling. This combination maintains the direct relationship between speed of the liquid and rotational speed of the turbo-rotor, regardless of viscosity of liquid being measured. When installed, it looks like a short section of the line. The Turbo-Meter measures the volume of liquid that passes through it, registers this in barrels on a standard mechanical register or counter, and can actuate, through its magnetic coupling, a magnetic switch that closes an electrical circuit, permitting the actual registration to be recorded many miles away. *Rockwell Manufacturing Co.*

Water-Soluble Cleaner

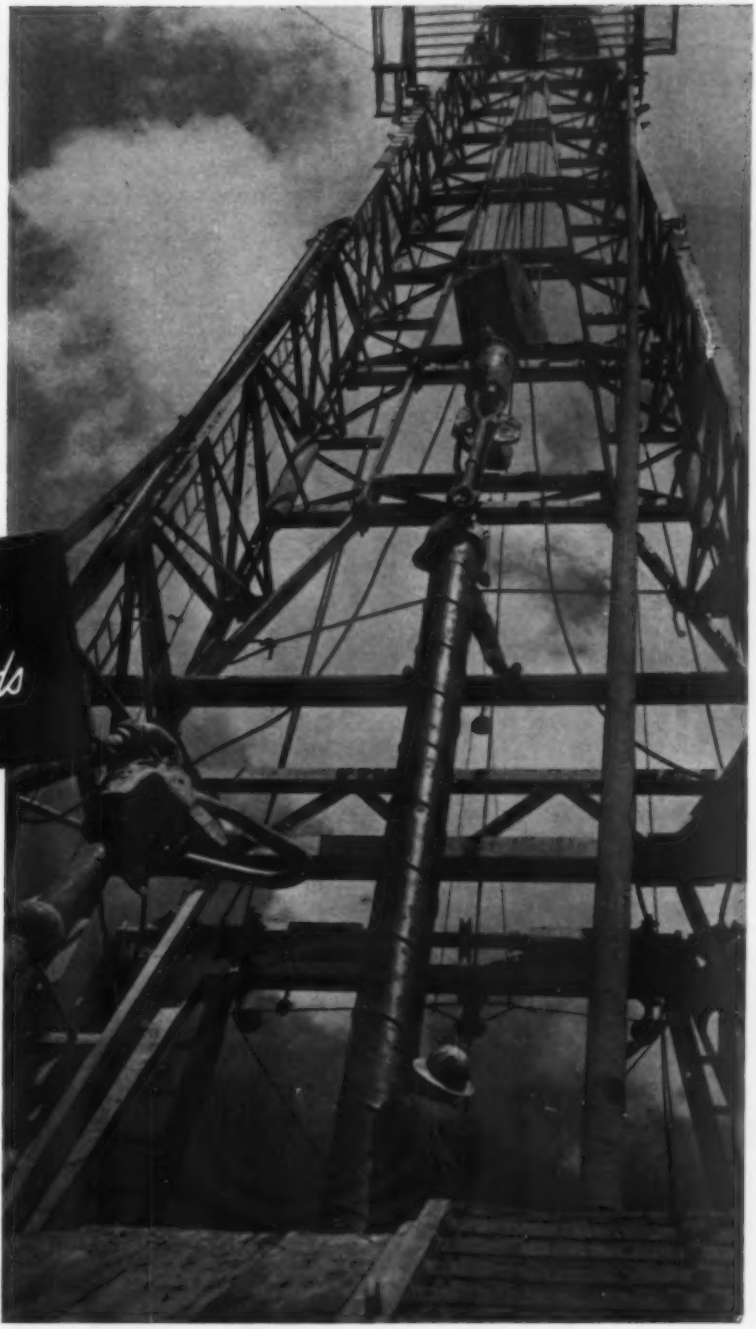
128 Conco Chemical Company has introduced a new chemical action equipment and parts cleaner that removes carbon, lubrication, and oil vapor stains. Non-flammable and non-toxic, Conco 1245 eliminates the fire hazards and loss of time due to the toxic effect to personnel using conventional solvent-type cleaners.

The new cleaner leaves no residue that will burn through paint. Oil and grease film normally found on equipment is easily removed with a mild solution. A slightly stronger solution will remove burned-on lubrication without harmful effect to painted surfaces. There is no need to stop an engine when cleaning a hot surface since Conco 1245 is completely safe in the presence of open flames or hot surfaces. *Conco Chemical Company.*

Dry Chemical, Portable Fire Extinguishers

129 Two new lightweight, pressurized dry chemical portable fire extinguishers, in 2½ and 5-lb capacities, that are said to put out as much fire as 8 and 16 carbon tetrachloride portables respectively, stress simplified, self-evident operation for anyone picking up a unit in a fire emergency. There is no trigger locking pin to remove, no valve to turn, no inverting, no bumping. Operation requires only aiming the discharge nozzle and pushing the easily depressed actuating lever. Pressure gages, recessed in the housing for protection, tell at a glance if they are charged and ready for action. Their operating range of from 110 to 180 psi means that they can be easily and quickly recharged with air or nitrogen. Their special wall brackets act as the locking pin and discourage accidental discharge. *Walter Kidde & Co., Inc.*

SURFACE CASING by NAYLOR



....Threaded or Slip Joint Ends

NAYLOR provides this economical, light weight conductor surface casing for rotary drilled wells in which the casing is to be cemented.

Casing ends are made of heavy steel plate—either threaded accurately to API standards or plain for slip joint field welding.

Store stocks are carried in 30-foot lengths for threaded casing and in 40-foot lengths for slip joint casing.

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COMBINATION STARTERS IN SPIN-TYPE ENCLOSURES

Here's Allen-Bradley's Bulletin 713 combination starter with circuit breaker—featuring conveniently removable spin-type cover and base—for use in hazardous gas and dust locations. Inside you'll find the time-tested A-B Bulletin 709 solenoid starter.

The consistent reliability of Allen-Bradley solenoid starters is a result of their design simplicity. With only ONE moving part, there's virtually nothing to go wrong—this is your assurance of millions of trouble free operations. In addition, the double break, silver alloy contacts are *always* in perfect operating condition—and remain so with *no* service attention. Also, all A-B starters have two permanently accurate thermal relays that protect motors against dangerous overloads. The reliability of these relays is not affected by atmospheric conditions or the length of time in service.

To insure maximum production with minimum maintenance, insist on Allen-Bradley *quality* motor control. Please write for full information.

Cutaway of Enclosure
Shows Allen-Bradley combination starter. Screw-type cover and base permit quick access to the starter or the circuit breaker.

A-B Bulletin 713
Combination Starter

NEMA 4
Watertight
Weatherproof

NEMA 7
Hazardous
Gas Locations

NEMA 8
Corrosive
Hazardous Gas

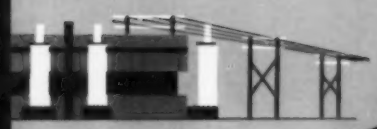
NEMA 9
Hazardous
Dust Locations

These enclosures remain available. Because of the trouble free operation of Allen-Bradley control, bolted covers are not a problem.

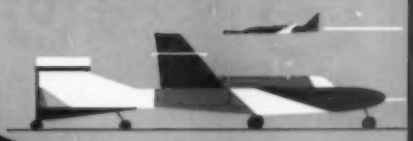
Allen-Bradley Co., 214 W. Greenfield Ave., Milwaukee 4, Wis. In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY Member of NEMA — *Quality Motor Control*

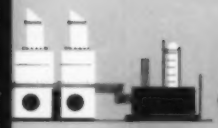
NEW AT BEAIRD



Steam discharge silencers

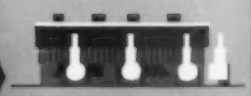


Jet engine silencers



Heat recovery silencers

MAXIM
AMF BEAIRD
SILENCERS



Industrial engine silencers

Ram Jet Silencers

Marine spark arrestor silencers

Heavy equipment silencers

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Qualified sound control engineers at AMF-Beaird-Maxim are ready to work with you on every silencer requirement from ocean going steamers to industrial plants . . . jet engines or even home lawnmowers.

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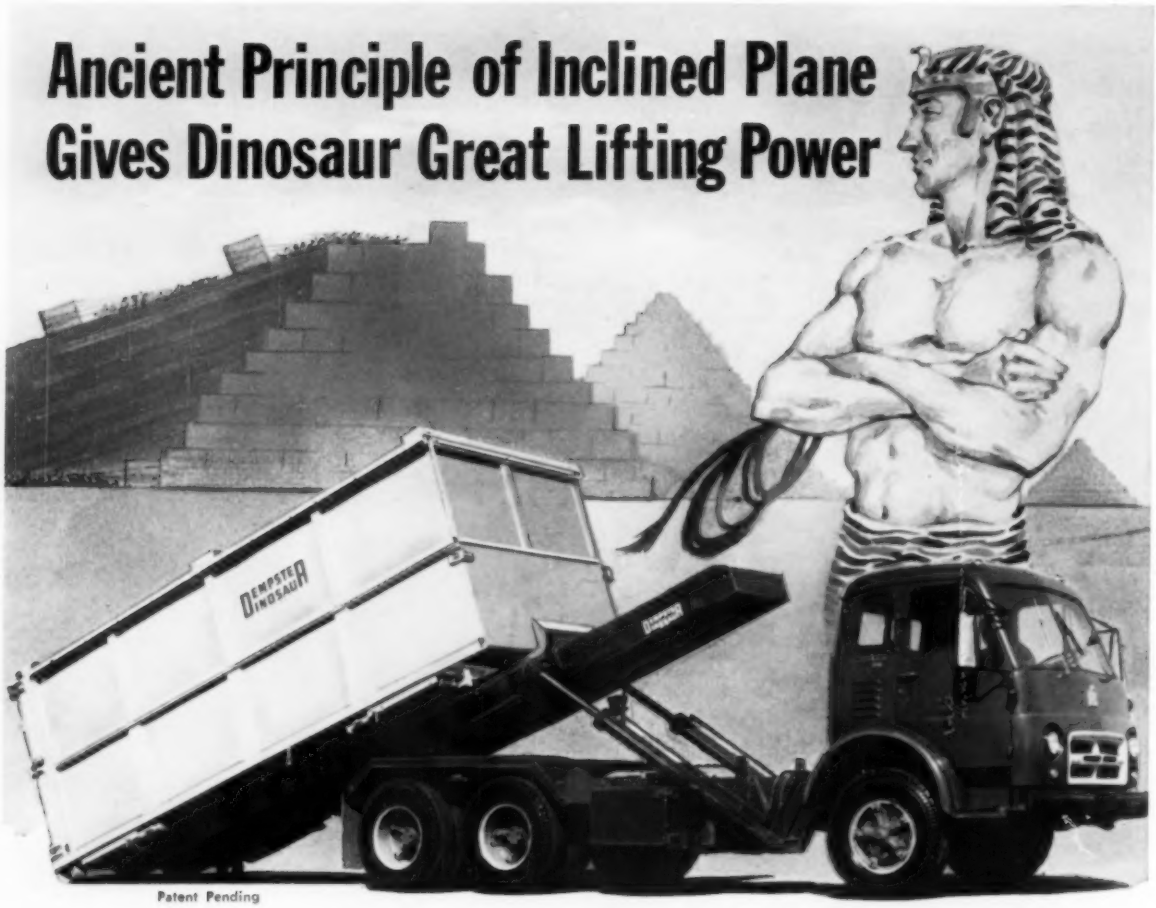
Ancient Principle of Inclined Plane Gives Dinosaur Great Lifting Power



Patent Pending

Use of an inclined plane is one of the world's oldest lifting principles. Huge earthen ramps, timbers, rollers and plenty of slave-power are reputed to be behind the secret of lifting the huge blocks of stone into place to form the pyramids of Egypt.

The DEMPSTER-DINOSAUR uses the inclined plane and hydraulics to achieve its fantastic load-lifting ability.

Instead of an earthen ramp, the Dinosaur uses a steel tilting skid frame which can be moved from horizontal to 45 degrees. Instead of slaves and ropes, the Dinosaur lifts huge containers into carrying position with a unique hydraulic ratcheting cylinder; then hauls and puts them down, or dumps them.

We believe that the size and weight of load is limited only by the capacity of the truck and highway weight restrictions.

If you need a detachable container system of unlimited size . . . or want to shift big weight handling from rails to the flexibility of rubber, write us today. We will furnish complete details.

Dinosaur Engages Container

Pulls It Up Tilting Frame

. . . Into Carrying Position

FREE BROCHURE

DEMPSTER DINOSAUR® SYSTEM

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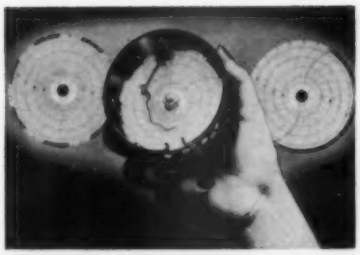


Recording Thermometer Has Dry Stylus

130 The Pacific Transducer Corp. announces a new, portable recording thermometer with a dry stylus which can be used as a field service instrument for recording time and temperature. There is no ink to spill, freeze, or run.

The thermometer, which uses a spring-wound clock movement, is made in 8 different temperature ranges with minimum of minus 40 F and maximum of plus 220 F. With a 24-hr or 7-day clock, the unit measures 3 15/16 in. in diam by 2⅞ in. high. Diameter of the chart used in the 14-ounce instrument is 3⅜ in. *Pacific Transducer Corp.*

Control Valve Is Color-Calibrated

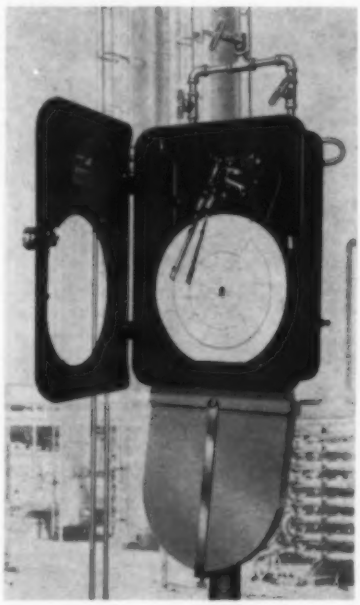
131 A new control valve suitable for use with air, oil, gas, water, or other fluids has been developed by The Manatrol Corporation. The adjusting scale is composed of permanent easy-to-read color graduations which enable even untrained personnel to check the valve setting at a glance, make quick adjustments, record the reading, and reset the valve when necessary. In addition, the screw is graduated numerically so that the valve can be set on Red 5, Blue 6, etc.

The valves are available in 5 standard sizes: ⅛, ¼, ⅜, ½, and ¾ in. Standard models withstand pressures up to 5000 psi with other sizes available on special order. *The Manatrol Corporation.*

Powdered Detergent Cleaning Compound

132 A new powerful yet gentle cleaning agent which emulsifies and saponifies oil and grease is manufactured by Jet-Lube Inc. and known as "Easy-Clean." A powdered detergent, it is easy on the hands, non-toxic in solution, and harmless to personnel. Containing no caustics, ammonia, nor abrasives, it is non-injurious to painted surfaces. Non-inflammable, it can be used particularly in critical areas of acute fire hazard. Storage life is indefinite; it will not absorb moisture or cake up. *Jet-Lube Inc.*

Changes Charts Automatically



133 A new method for automatically changing circular recording charts has been patented by the Maeder-Squire Company. Called the Automatic Meterman, the device can be installed in any standard recorder case to provide a method for utilizing as many as 40 circular charts in a single recorder. The device disengages the completed charts one by one at preselected times and drops them by gravity into a self-contained storage box.

Any number of field or plant recorders can be changed at the identical moment, making it possible to correlate automatically the charts with master meter charts without multiple computations. Users of 7-day charts can improve measurement accuracy through use of 24-hr charts without increasing field or plant operating costs. *Maeder-Squire Company.*

Compact Spark Arrestor Can Replace Muffler

134 A compact spark arrestor that approximates the size and shape of a muffler and uses a straight-through exhaust-flow-principle and a new cyclonic action that is almost 100 percent efficient in trapping dangerous incandescent exhaust carbon is now ready for pickups, loaders, and smaller tractors, trucks, and stationary engines. This Type C Gill spark arrestor is made in sizes to accommodate both gas and diesel engines up to 325-cu in. displacement and, in most applications, can replace the muffler and occupy that same space. It is said to be highly efficient at all throttle ranges. Its backpressure is very low. Having both inlet and outlet fittings, it can be placed at the end of, or within the exhaust system, and mounted horizontally, vertically, inverted or at any angle. Exhaust carbon is retained within the arrestor and dumped periodically through an easily accessible port. *Erickson Products Co.*

Alarm for Force-Feed Lubrication Systems

135 A protective device for use on force-feed lubrication systems is manufactured by Manzel, a unit of Houdaille Industries, Inc. The "Lube-Line Alert" is installed at each terminal point of lubrication by simply cutting the line and connecting the fittings. Unit is connected electrically to many types of warning devices.

The standard unit, which measures only 3⅝ by 1 by 1½ in., has universal application up to 10,000 psi. Deliveries at the terminal points may be as low as a fraction of a drop per stroke and will handle any viscosity oil or synthetic. It consists of a stainless steel body, a plunger, a spring, and a free-moving magnet. The hermetically sealed-in glass switch which is set in a potting compound is a magnetically-actuated, single pole, single throw, normally open, snap action type. Normally closed switches are also available. *Manzel, a unit of Houdaille Industries, Inc.*

Pneumatic IC-Engine Safety System

136 A new all pneumatic, inherently explosion-proof, engine control system has been developed by the Fulton Sylphon Division of Robertshaw-Fulton Controls Company. Developed as a safety shutdown system for internal combustion engines with all variables (temperatures, pressure, liquid levels, vibration, engine speed) contin-

uously monitored, it can be expanded to cover automatic sequence start/stop functions with all stages sequence controlled.

The system operates on 25-psi air supply, dead-ended to limit air consumption. Each non-resetting bullseye annunciator incorporates a mechanical indication of the condition of its measured variable. A malfunction in any monitored variable produces immediate response, shutting down the engine pinpointing the cause of shutdown. The "unsafe" indication remains visible until engine restart, possible only after the malfunction has been corrected. *Fulton Sylphon Division, Robertshaw-Fulton Controls Company.*

Permits Precision Loading Up To 100 Tons

137 Capacity rating has been extended to 50 and 100 tons in 2 new sizes of the Hydra-Set, auxiliary crane and hoist control instrument, which is installed as a link between a crane hook and a load in the precision assembly and disassembly of heavy equipment, machinery, and structures, and as a rigging aid, strain gage, crane scale, and portable testing device. Hydra-Set is hydraulically operated and requires no outside power source. One man can lower or lift a load up to 100 tons a distance of 12 in. with linear accuracy to within 1/1000th of an inch, according to the manufacturer.

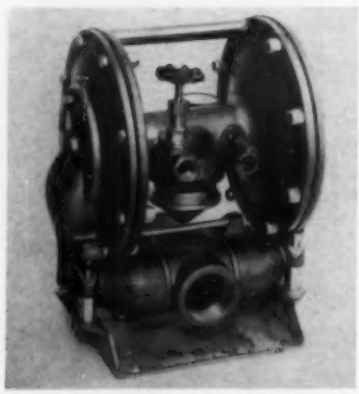
Lowering action, at speeds of from 0 to 8 ft per min, is controlled by a "down" lever operating a valve that meters hydraulic fluid from a cylinder underneath a load carrying piston to storage in a second cylinder. Raising a load is accomplished by an "up" lever, moved up and down manually to operate a small pump that withdraws fluid from the storage cylinder and delivers it under pressure to the power cylinder. *Mefco Sales & Service Corp.*

New Liquid Stirrer

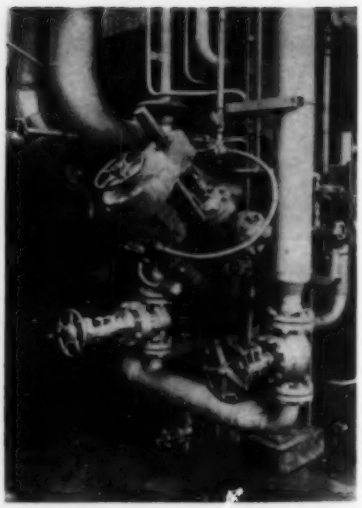
138 Development of a new variable speed laboratory-type stirrer for liquids has been announced by Herman H. Sticht Company, Inc. The instrument, stepless and mechanically adjusted, features extremely broad speed range with 2 motor shafts: Low speed approximately 18 to 270 rpm; high speed approximately 150 to 2250 rpm. Both low and high speed motor shafts are hollow, allowing for quick stirring rod adjustment to any height.

Stirrer incorporates totally-enclosed, air-cooled induction motor without brushes or commutators, cutting explosion chances due to sparking. Motor is maintenance-free with ball bearings assuring silent, trouble-free continuous operation. Torque climbs with decreasing speeds, giving power when it is needed. *Herman H. Sticht Company, Inc.*

Air Or Gas Operates New Utility Pump



139 A portable, air or gas operated, double diaphragm, utility pump has been introduced for use in sumps, bilges, mud pits, trenches, and tanks for pumping gasoline, mud, oil, water, etc. The compact, 70-lb pump with 2-in. suction and discharge, air pressure relief valve, carrying handle, steel base plate, and air reduction control valve is operated on air or gas pressure from 5 to 100 psi and provides closely controlled discharge volumes from 1 to 60 gal per min. The double acting diaphragm design handles solvents, slurries, and even liquids containing solids to ⅜ in. in diam. Its simple design eliminates packing, starting, and sparking problems. It is said to be practically unaffected by abrasives in the pumped liquids. Discharge pressures from vacuum to 60 psi are possible. It will pump from 14 ft of water, dry, or suction to 28 ft of water when a foot valve is used. *Texsteam Corp.*



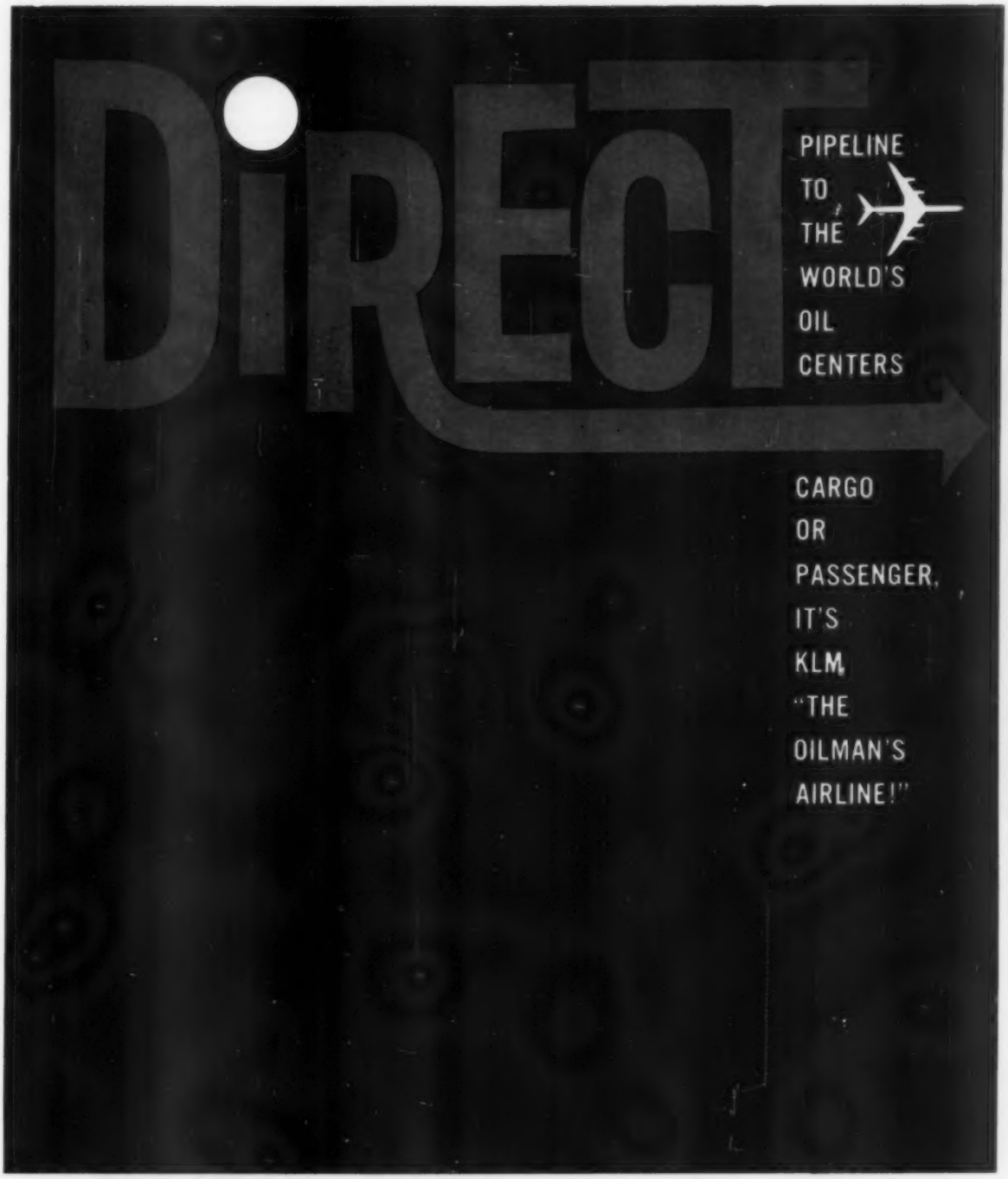
Electric Actuator For Existing Valves

140 An electric valve actuator incorporating mass produced standardized components is now available for motorization of valves already installed and originally intended for manual operation. The unit is frequently fitted to valves that remain in operation throughout assembly, the manufacturer states. On closing, a purely mechanical torque limiting device ensures sealing, whereas on opening a sustained reinforced torque is applied that is said to loosen even very "sticky" valves.

SADI RX actuators, said to guarantee valve opening or closure regardless of whether or not incorporated limit-switches function, can be delivered any speed from 200 rpm down to a fraction of an rpm and thus comply with most opening times specifications. Auxiliary manual operation is facilitated by a clutch that reduces the manual torque required. Optional extras include auto-declutch and hand wheels, interlock clutch arrangements, and a "travel selector" that limits valve travel in one or both directions. *Societe Auxiliaire D'Industrie.*

New Compact Diesels With Low Lb/Hp Ratios

141 Offering a wide choice of attachments to make them adaptable to many applications are 3 new, compact engines that are 4-cycle, valve-in-head precombustion chamber diesels available either turbocharged or turbocharged and aftercooled. They are said to be ideal for powering construction, well servicing, material handling, pit and quarry and auxiliary equipment. As packaged generator sets from 40 to 125 kw, they also serve a wide range



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of industrial and marine applications. The most important single feature is the overall compactness. This design provides ratios of 11.1 lb per hp for the D320, 9.6 for the D330, and 8.4 for the D333. The Cat-designed and built precombustion chamber fuel injection system includes low pressure fuel pumps and large, single orifice injection valve capsules, enabling the engine to burn an extremely wide range of fuels ranging from JP4 jet fuel to crude oil without changing fuel pumps or injectors. *Engine Div., Caterpillar Tractor Co.*

Force Control Switches

142 W. C. Dillon & Company, manufacturers of force control switches, has introduced a new line of sub-miniature models, slightly longer than a paper clip, covering ranges of 0-5, 0-30, and 0-100 lb. These small switches join Dillon's regular line of switches for force control to 50,000 lb. Automatically triggering from 1 to as many as 4 separate micro-switches, the controls accommodate an infinite number of operational points, start and stop motors, trip relays, sound audible warnings, and activate visual signals. *W. C. Dillon & Company, Inc.*

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Chemical-Type Dehydrators

143 Dissipating chemical dehydrators manufactured by Dehydrators, Inc. remove water from gas, liquids, or air by using chemical compounds which adsorb water. Dew points can readily be reduced to −100 F. A 10-micron glass filter, located on top of the unit, traps particles suspended in the process stream.

A compensating cartridge, filled with a chemical compound under constant compression, is fitted with a spring-loaded bottom plate which presses against the compound, assuring positive contact with water-laden gas, liquids, or air. A water-level gage is marked at a point signaling the proper time to replace the compound for maximum dehydration. *Dehydrators, Inc.*

Crane Scale Weighing Advance

144 Martin-Decker Corporation has available a new remote indicating crane scale, called an important advance in the field of crane scale weighing. The weighing element is separate from the indicator, permitting excellent readability even though the load is suspended 50 ft or more above the floor. The load-element can be picked up by the crane hook and the indicator can be mounted at eye level. In one model series, the load-element and indicator are mounted on a convenient handling cart which doubles as a portable panel to bring the indicator to eye level. Unit is available in capacities zero to 10,000 lb and zero to 60,000 lb. *Martin-Decker Corporation.*

Dry Chemical Wheeled Fire Extinguisher

145 This 350-lb dry chemical wheeled extinguisher has been awarded a 16-B:C rating, the highest ever granted a fire extinguisher by Underwriters' Laboratories. The rating indicates that a novice using the extinguisher for the first time should be able to put out a standard gasoline pan fire 160 sq ft in area. During testing standard gasoline fires of 400 sq ft were

consistently put out by UL experts in 11 sec.

Previous high rating for an extinguisher with 350-lb dry chemical capacity was 80-B:C. The new rating was given because of greatly increased effectiveness due to new design features which increase the rate of flow and improved distribution of dry chemical in the steam pattern. *Ansul Chemical Company.*

Fiberglass Truck Canopies

146 A new line of fiberglass canopies designed to provide all-weather protection for pick-up truckloads is being manufactured and marketed by Kimel Company. Canopies are molded 1-piece construction and weigh from 100 to 150 lb. They are currently manufactured in 10 basic models and can be molded to meet many specialized designs. *Kimel Company.*

Pulsation Dampener For Reciprocating Pumps

147 A new flanged pulsation dampener that has a volumetric capacity of 420 cu in. and yet weighs only 115 lb, has been developed for small and medium size reciprocating pumps. The Ball Type BLS-25F, available with a number of different sized flange connections, incorporates a specially designed synthetic rubber bladder that is in a non-stressed condition when it is charged with nitrogen. Thus, its service life is said to be greatly increased. It is able to flex in a unilateral movement in absorbing pressure surges with minimum amount of stretching and wrinkling. Cast alloy steel housing with a minimum number of parts provides ease of servicing without special tools. *Ball Manufacturing Co., Inc.*

Small Rotary Gas Meter For Line Mounting

148 A light, 55-lb rotary-type positive displacement gas meter that can be flange mounted directly in either a horizontal or vertical gas line without need for additional support to provide straight-through gas flow has been announced. A flow range to 3000 cu ft per hr, combined with a working pres-

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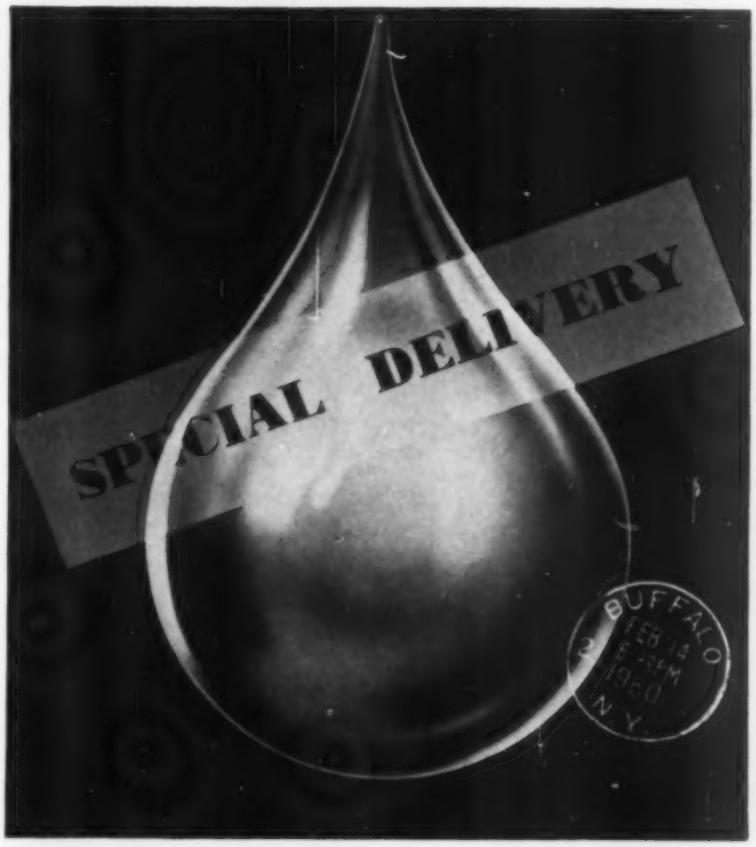

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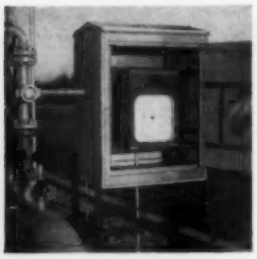

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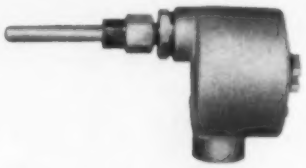
- For indication of high or low level in closed vessel
- For interface control in closed vessel
- May be adjusted to ignore foam and react to liquid or to detect presence of foam on liquid
- Model shown features compact, unitized construction with plug-in components
- Contains hermetically sealed DPDT relay to actuate alarm lights, horns, etc.



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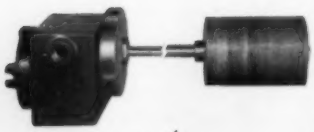

MIC-O-FLEX SWITCH

An electric, positive action float-type liquid level controller. Model CMEQ, shown, uses a Flextube® to actuate a micro switch. May be used as high or low limit switch to sound alarm, flash signal lights, start or stop fluid transfer pumps or operate control valves. Unaffected by extreme pressures and temperatures.

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PIONEERS IN LEVEL MEASUREMENT AND CONTROL INSTRUMENTATION

sure rating of 125 psig, adapts this meter to many industrial and commercial loads, and the permanent and non-adjustable accuracy feature claimed also makes it well adapted to service in remote or unattended locations. The standard production meter is equipped with a volume register reading directly in cubic feet of displaced gas. By mounting this counter within one of the end covers, with readings taken through a heavy glass window, drive problems inherent with externally mounted counters are considered to have been eliminated. The entire unit is made gas tight and heavy, domed end closures that also carry the oil supply and are equipped with simple oil level sight glasses. *Roots-Connersville Blower, one of the Dresser Industries.*

High Speed Mixers

149 A new high speed mixer, called the Dispersator, is being offered by Premier Mill Corporation. Tool features new head, offering high intensity shearing and dispersion. Available in simplex and duplex versions, the new head has been designated "Micro-Shear." *Premier Mill Corporation.*

Strong Ductile Iron Gate Valves Introduced

150 A new line of ductile iron gate valves is said to be as corrosion-resistant as gray cast iron and three times as strong; plus being nearly as strong as carbon steel. It has been introduced for service on sour crude, other process lines in refineries, tank farms, and for handling crude. They are of nodular or spheroidal cast iron content. The metal has high thermal shock resistance. All ductile iron pressure-containing castings bear the symbol "NCI" and meet the requirements of ASTM A395-56T. This specification calls for a minimum of 15 percent elongation in 2 in.; crane ductile cast iron has 18 percent elongation. They are available in 2 through 12-in. sizes and are recommended for oil services at temperatures from minus 20 F to plus 650 F. *Crane Co.*

High-Volume Blowers

151 New lobe-type rotary positive blowers and gas pumps featuring 1-piece shafts slip-fitted through and bolted at the gear end of the impellers, are now being offered by Sutorbilt Corporation. The advance design permits an increase in the diameter of the shaft's critical area between the impeller and gears without the loss of impeller strength caused by an enlarged bore. Also avoided is the use of the

drive impeller, which tends to deflect the main impeller. A further advantage of a shaft larger at the gear end is the reduction of torsional deflection between timing gears and impellers, increasing pressure and horsepower ratings.

These new units are designed to handle from 800 to 20,000 cfm at pressures from 2 to 10 psi continuous (12 psi intermittent). They are recommended for use on all heavy-duty industrial systems which have high volume air requirements. Machined subbases are provided with the new line, termed Series 3200. *Sutorbilt Corp.*

New Aluminum Grating Offers Safety Features

152 A new spark-proof, corrosion resistant aluminum grating is now included in Kerrigan Iron Works Company's open metal flooring line. Distinctive features include square crossbars which are forced through pierced bearing bars and then pressured between bearing bars to become permanently locked together. There are no bolts, rivets, or screws to become loose and rattle. The grating is especially recommended where fire hazards exist. *Kerrigan Iron Works Company.*

Automatic Charger Has Stepless Control

153 A new line of modular-design silicon battery chargers for lead-acid and nickel-cadmium batteries has been introduced, whereby the charging current and voltage are automatically controlled through a stepless transition from beginning to end. This is accomplished irrespective of line voltage or frequency change without the use of any moving parts such as relays, timers, electronic tubes or delicate semi-conductor devices. The manufacturer claims very fine end voltage regulation is obtained (less than 1 percent), thereby reducing the end charging current to a very low value (in the order of 20/1 of the rated charger capacity). Units, available in capacities of 1 and 3 amp for battery systems from 6-120 v d-c, operate from single phase power. *Hughes Electronics Co.*

Portable Repair Kit

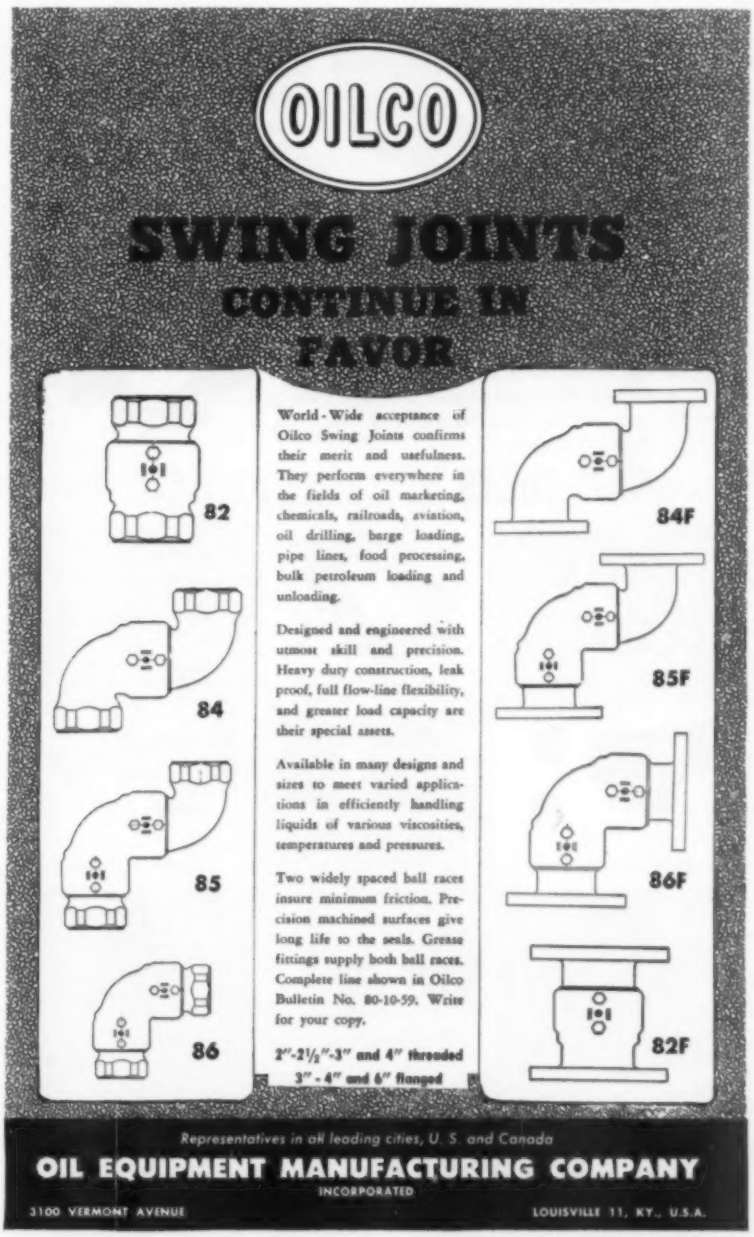
154 A new portable repair kit is being offered by Dresser Manufacturing Division, designed for simple, economic and rapid permanent repairs to pipe and tubing, pipe joints, pipe fittings, and tanks. The Util-Seal kit doubles as a carrying case and is compact enough to be carried as spare gear on all service vehicles. Leaking bell and spigot joints, flanges, saddles, and caulked sleeves, as well as cracked valve bonnets and leaking threads can be quickly repaired by ordinary labor. Kit is recommended for minor repairs in inaccessible spots such as gas mains.

Packaged so as to avoid waste in the field, kit contains individual portions of resin, activator, and fibrous reinforcer as well as a collector ring and pressure relief vents for use during setting-up period. Material can be mixed in the field in the resin can, stirred, and applied with a wooden paddle. *Dresser Manufacturing Division.*

Two-Stage Compressors Available Preassembled

155 A new line of compact, preassembled 2-stage rotary compressors, specifically designed to simplify installation and foundation problems, has been announced by Fuller Company. Featuring an overhead intercooler for greatest compactness, the unit can be placed for operation either on a floor or mezzanine. All that is necessary at the installation site is the addition of motor, air, and water piping.

The new line includes 2-stage models with capacities from 279 to 3300 cu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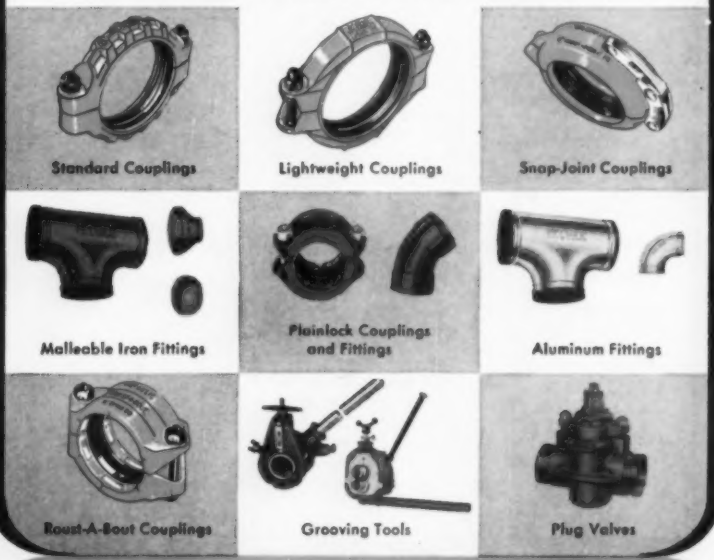

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ft per min and discharge pressures to 125 psi. Direct connection can be made to electric motors, gas motors, or gear-turbine drive. Each stage comprises a cylinder with heads, thoroughly water-jacketed. Intake and discharge openings are located in a horizontal plane on opposite sides of the cylinder, avoiding reversal of air flow and further simplifying piping. *Fuller Company.*

Portable Locator

156 A new portable, transistorized locator consisting of amplifier box, carrying handle, detection head, earphones, and operating instruction compactly housed in a handy carrying case — has been announced for locating metallic masses concealed underground. Features of the Model 620T include a transistorized receiver packaged in a lightweight aluminum box, precision-wound detection loops, a transistorized oscillator contained within the detection head, and a single tuning control. *The Goldak Co., Inc.*

Hydraulic Outriggers For 1-Man Operation

157 Now in production at Crane Carrier Corporation is a new hydraulic outrigger line which enables one man to sight-level and set the largest truck crane in 2½ min. Equipment features full control system which allows individual adjustment of each horizontal beam and vertical jack. Full stability and safety under heaviest loads and on most erratic terrain are thus provided. Horizontal placement of the left and right outriggers on the truck is controlled by parallel circuit valves. Outriggers, which eliminate shock and twist during operations, are offered in 3 models in wide range of sizes. *Crane Carrier Corporation.*

Streamlined, Package Brushless Generator

158 A new package brushless generator designed to eliminate sparking has been announced, with a selection of adapters that makes it possible to attach the generator to most any driver. Auxiliary equipment is compactly mounted within the yoke enclosure, a design that permits direct mounting of a switchboard on top of the unit. Conduit space is located on top of the generator to provide an enclosure that is integral to the frame. Instruments are at a readable height and placed in a side recess that also shelters a forced cooled, completely static, current compounded voltage regulator. Removable plates provide left or right hand conduit entry. The

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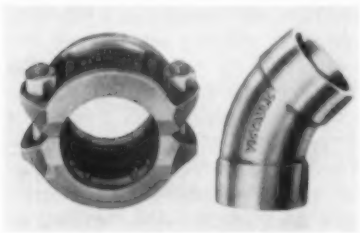
Available in 100, 125, 150, and 175-kw, 60-cycle, 1800-rpm units, the new generator is designed to permit 2-bearing arrangements suitable for belted or direct coupling to any motor or engine and to deliver a low telephone influence factor and minimum radio and TV interference. *Allis-Chalmers Mfg. Co.*

Piping Package For Plain End Connections

159 The Plainlock Piping Method for the first time offers to the industry a complete package of couplings and fittings in sizes over 2 in. for connecting plain end pipe, according to the manufacturer. No set-up is needed, and the only tools required are a pipe cutter and an ordinary wrench. Lightweight, ruggedly-built Plainlock



couplings are designed with 2 bolts for fast, easy installation, are fitted with hardened stainless steel grips that engage pipe ends and securely lock them together, and have "triple-seal" gaskets that assure leak-tightness.

Plainlock fittings are engineered with long radii "full-flow" sweeps for good hydraulics and minimum friction loss and are available with plain ends or in combination of plain and grooved, threaded or flanged ends for interconnection of other piping systems. Ordinary plain or beveled end pipe may be used "as is." Additional uses for Plainlock are in replacing rusted-out fittings or leaking sections of pipe in an existing piping system. *Victaulic Co. of America.*

Transistorized Pocket Radio

160 New all-transistorized shirt-pocket personal radio communications receiver has miniaturized circuitry that boosts audio efficiency and requires 35 percent less battery power than previous hand-carried message equipment of its type. Called the "Voice Director," the unit weighs only 12 oz with battery. Although power consumption is reduced, the device is said to have receiver selectivity and receiver sensitivity comparable to mobile radios many times heavier and larger.

Because less power is consumed, a smaller battery is employed. The receiver uses a 6½-v, single mercury battery. A built-in ferrite loop-stick is used for an antenna, eliminating the need for an externally-mounted antenna.

A convenient directive horn, tiny and easy to clip to the wearer's lapel, is used when privacy is not required and when loudness of the radio will not disturb others in the vicinity. An earpiece may be used at group meetings or in other instances when the person wearing the unit desires to hear to the complete exclusion of others. *General Electric Company.*

Low Boy Trailer With Special Rear-End Ramp

161 A new low boy trailer with a specially designed rear-end ramp to facilitate loading is announced. Model TL-25D has a 25-ton capacity with 20,000 lb axles; 12½ by 5¾ air brakes; cast iron spoke wheels; 13-ft long by 8-ft wide platform; and 23-ft overall length from the rear of the gooseneck to the end of the ramp. The

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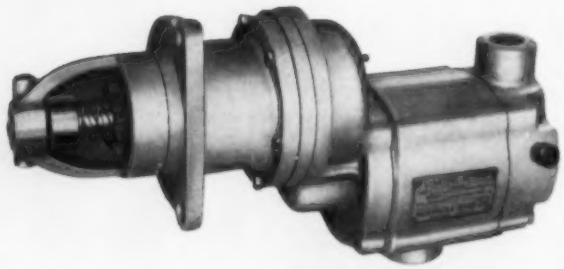

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Books To Read...

Oil Property Evaluation, *by John M. Campbell, University of Oklahoma. Published by Prentice-Hall, Inc., Englewood Cliffs, New Jersey.*

Book gives a detailed analysis on calculation of reserves and prediction of future reservoir performance. Included are methods used and guide to aid in selecting proper one for a particular property valuation. A comprehensive discussion of oil economics is presented that shows how to apply principles to actual problems. Chapters discuss quantitative application of tools used to obtain data, including decline curves, electric and radioactivity well logs, core analysis, geological data, and various formation testing devices. A close-up look is taken at estimation of costs and evaluation of petroleum processing facilities. Complete section is devoted to economics and analysis of profitability.

Elements of Petroleum Reservoirs *by Norman J. Clark, petroleum consultant. Published by Prentice-Hall, Inc., Englewood, New Jersey. Pages, 260. Price $7.*

Book presents in simple, straight-forward, well illustrated fashion the complex science of reservoir behavior and control. It is written particularly for the non-reservoir engineer who seeks a basic and fundamental understanding of petroleum reservoirs. Chapters discuss petroleum's origin, rock characteristics, oil and gas characteristics, fluid distribution, natural oil drives, oil producing characteristics, natural oil displacement, development and operations, oil production rates, oil lease operations, gas producing characteristics, gas reservoirs, miscible drive, combustion drive, and reservoir exploitation.

Analysis Charts for the Determination of True Resistivity from Electric Logs, *by Hubert Guyod and John A. Pranglin, Published by Hubert Guyod, consultant, P. O. Box 282, Bellaire, Texas. Price, $22.50.*

Book presents a method and gives necessary charts for determining simply and rapidly the resistivities from an electric log comprised of the 16 in. and 64 in. normals and the 18 ft 8 in. lateral. Book contains over 250 charts that permit determining R_t and, in many cases, R_i and D_i for single beds from 2 to 50 ft thick and for comprehensive ranges of resistivities (R_t, R_i, R_s and R_m), hole sizes and invasion diameters. Instructions are given for application of the data to certain non-uniform formations. A discussion of the resolving power of resistivity curves and of the effects of inaccuracies in the various pertinent factors (R_s, R_m, $R_s \cdot e \cdot d$) is offered.

Personality and Organization, *by Chris Argyris. Published by Harper & Brothers, 49 East 33rd Street, New York 16, New York. Pages, 284. Price, $4.*

The technology of materials and processes have now given way to a new star in the business field — people. Concern of management for methods in dealing with people holds promise of greater advance in the future.

This volume by an associate professor of Industrial Administration and Research Project Director of the Labor and Management Center at Yale University covers the human factor in organization. In his preface, the author says "I hope that the human relations researchers in the universities and the human relations and personnel special-

ists in industry will find the book of value. It should be of some help to line and staff executives who are tired of those analyses of human problems that purport to provide simple answers but which, when stripped to their essentials, are gimmicks. Human beings are not simple and they deserve the consideration of not being manipulated by trick or specious methods. These may be useful for machines; human beings deserve the respect of a basic philosophy."

He claims the formal administrative structure tends to make the employee feel dependent, submissive and passive and the so-called dynamic leadership type of management tends to emphasize the causes of employee antagonism. Human relations programs do little to alleviate this problem.

The thesis is enough out of the ordinary to hold ones attention. The author has an interesting discussion of individual and group adaptation, and brings out the fact that there is a strong managerial class in unions.

Corrosion Data Survey, *compiled by George A. Nelson, Shell Development Company, Emeryville, California. Price, $50.*

Newest edition of this reference work by a staff metallurgist at Shell's Emeryville Research Center presents the latest corrosion information available from scientific literature from all parts of the world, illustrating in a general manner the behavior of about 1500 corrosive environments when in contact with approximately 50 constructional materials.

By using a unique chart method of presentation, the author has compressed a great deal of information into a small amount of space. The reader can tell at a glance the best type of material to use for a particular stream in con-

(Continued on page E-29)

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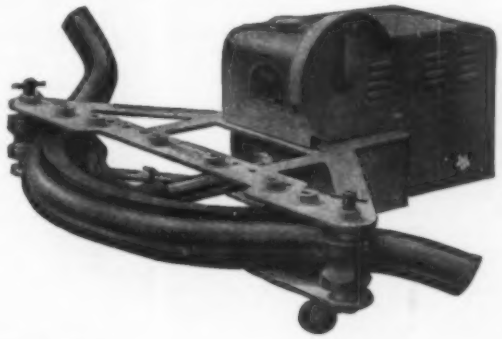

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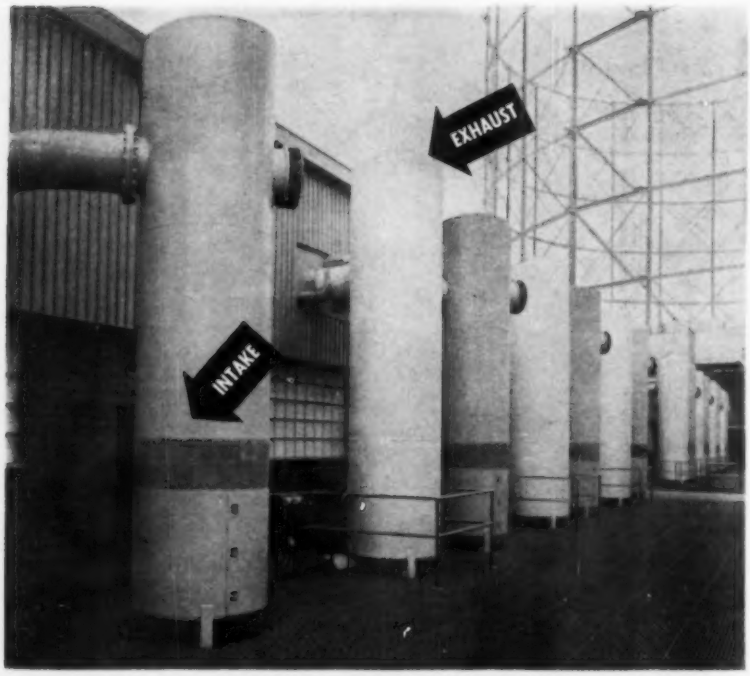

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Silent Twins can be furnished with either of two types of filters — depending upon the dust load. One is petrolatum-treated hogshair, extensively used in the Gulf Coast area, the Eastern United States, and other light dust load areas. For the Western United States and in areas where heavy dust is a factor, we recommend a special felt material that will load up and hold dust and dirt of a very small micron size without carrying over to the engine. Both types have proved to be the best-accepted, lowest-cost, and lowest-maintenance filters available. The filters are contained in a compact cartridge which is easily installed and removed through large access doors in the filter chamber.

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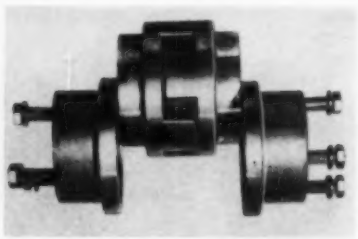
clear length gooseneck on the new low boy is 80 in., king pin setting is 18 in., and length from the king pin to the end of the ramp is 30 ft, 10 in. Six side brackets are optional to extend the width of the unit to 10 ft. The trailer is equipped with ICC lights and reflectors, turn lights, 8 "D" rings and 2¼-in. hardwood flooring. Height of the platform with 9:00 by 15 tires is 38¾ in. and approximate weight of the unit is 9800 lb. *Leland Equipment Co.*

Permits Disassembly Of Connected Machinery

162 A radially removable flexible coupling that transmits power through a 1-piece cushion and provides a simple means of disconnecting 2 units without axial movement of the shafts has been announced. The Type RRL, it is said, simplifies maintenance and is especially suited for applications where



driven equipment such as a pump must be disconnected while the driving unit continues to operate. All that is necessary in such cases is to disassemble the coupling itself. Since the load is transmitted by compression of the 1-piece spider type cushion, there is no wear on the metal jaws. Horsepower ratings range from 7.5 to 40 at 1800 rpm. Maximum bores range from 1¼ to 2¼ in. with maximum OD's from 2 9/16 to 5 in. Maximum overall length runs from 6⅛ to 7⅝ in. *Lovejoy Flexible Coupling Co.*

Drying Time Reduced On Metal Treatment

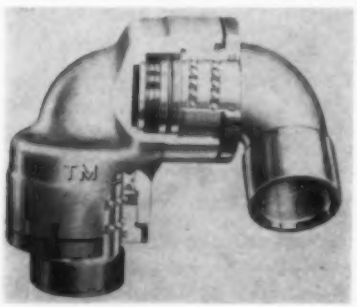
163 To reduce drying time to approximately half the 12 hr formerly required, a new drying agent has been added to "Ospho," the metal treatment that stops rust action and chemically changes rust (iron oxide) to iron phosphate, an inert surface that provides a base for regular maintenance paint. "Ospho" is brushed or sprayed directly on rusted metal after loose rust and scale have been wire-brushed off. Colorless, non-toxic, non-flammable "Ospho" also prepares new metal for paint and gives coverage of up to 600 sq ft per gal. *Rusticide Products Co.*

Malfunction Detector Protects Machinery

164 The Model 65 Vibraswitch manufactured by Robertshaw-Fulton Controls Company provides maximum protection for large motors, pumps, compressors, and other rotating equipment by responding to mechanical malfunctions the instant they occur. Failing bearings, bent shafts, broken blades, overspeeding, and similar malfunctions cause increased imbalance or high frequency vibrations detectable with the Vibraswitch. It may be wired to actuate an alarm or cause a shutdown before damage occurs. *Robertshaw-Fulton Controls Company.*

Improved Swivel Joints

165 T-M swivel joints, utilizing the "union assembly principle" wherein all service can be completed without disturbing the ball bearings, are announced. This feature allows take-up to compensate for packing wear, which in turn extends packing life as much as 400 percent, eliminates zero pressure leaks, and allows repacking to be completed in the field in a minimal amount of downtown, accord-



ing to the manufacturer. They are manufactured in ⅜ through 12-in. pipe sizes; in aluminum, bronze, iron, steel, stainless steel, and special alloys; in eight basic styles with standard and special end connections. In utilizing Garlock chevron packing, T-M swivel joints enable operators to pack with Viton-A, Kel-F, Teflon, neoprenes, bunas, silicones, asbestos, or compounds thereof, in temperature ranges from minus 329 F to plus 550 F. *Thornton-Mills Mfg. Corp.*

Primary, Emergency 1-KVA Power Inverter

166 Of special interest to all users of microwave communications systems is the Onan-developed transistorized 1 kva inverter unit that converts battery current to alternating current of the proper voltage and frequency to operate microwave or other similar electronic equipment, serving this need whether the power required is to be of a continuous or emergency nature and where no interruption in the power source can be tolerated. It supplies with only a 20-millisecond time lapse a-c power to the load on interruption of commercial power, and, where not even this lapse in power can be tolerated, can be installed and operated as a continuous power supply.

The basic "Instapac" consists of the transistorized power unit, start-stop relay, and power transfer relay all mounted on a front panel to fit a 19-in.-width rack mounting. *D. W. Onan & Sons, Inc.*

Compact Valve Features Easy Maintenance

167 A new, extremely simple, compact valve has been designed specifically for meter runs, separator lines, tank batteries, meter manifolds, tank runs, and all general pipeline service in both lever operated and hand wheel operated models in sizes ranging from 2 to 36 in. The G-5 provides a seal on the upstream and downstream sides of the gate. One valve and a spool, previously required in assemblies for block and bleed service, are eliminated.

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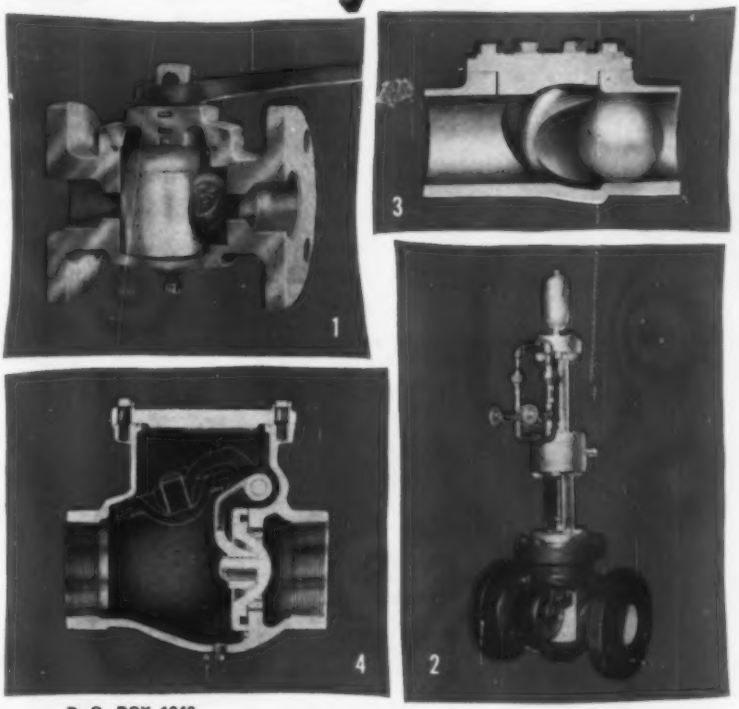

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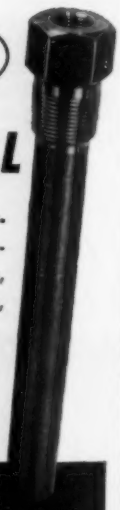

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plates for continuous scraping action through all gate positions, and the manufacturer's patented application of nitrile rubber O-rings provides squeegee action to keep the side plates clean and eliminate need for lubrication. When in open position, the G-5's O-ring is completely removed from flow preventing damage from foreign matter in the flow line. Other features include a bleeder plug that permits venting of the body cavity with the valve in closed position and springs that hold both metal seat rings against body side plates. *Grove Valve and Regulator Co.*

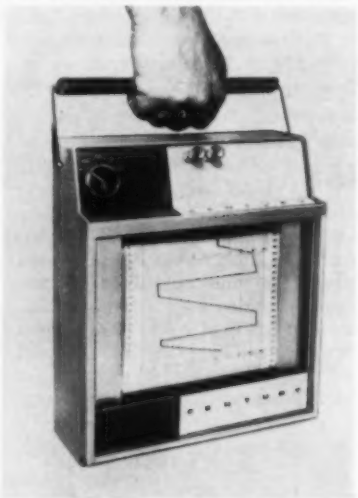
Helical Gear Speed Reducers

168 Link-Belt Company's expanded line of helical gear speed reducers is described in a new catalog which provides complete information on 20 reducer sizes in double, triple, and quadruple reductions. These sizes are divided as follows: double reduction — 8 sizes, ratios from 6.2:1 through 38.4:1, up to 206 hp; triple reduction — 7 sizes, ratios from 47.1:1 through 292:1, up to 44 hp; quadruple reduction — 5 sizes, ratios from 195:1 through 2217:1, up to 3.08 hp. *Link-Belt Company.*

Portable Recorder

169 Century Electronics & Instruments, Inc. announces its portable industrial recorder, the 450. Designed for a wide range of industrial uses, the self-powered recorder can be used for measuring and recording variations in humidity, temperature, vibration, acceleration, and other phenomena.

Completely modular in construction, the unit weighs only 11 lb. It operates on ordinary flashlight batteries or the



rechargeable type and is capable of 200 hr of continuous operation. Fully transistorized, the null-balance instrument has a 100 millivolt full-scale sensitivity with better than ½-percent accuracy. It holds 120 ft of chart paper with a closed take-up spool. A 2-channel model is also available. *Century Electronics & Instruments, Inc.*

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(Continued from Page E-25)

centrations to 100 percent and temperature ranges from 75 to 800 F for corrosion rates of less than .002 in. per year to over .05 in. per year.

The cross index bringing together chemicals of similar composition makes the information more readily available for purposes of comparison.

This book should prove helpful to plant operators and equipment designers as a guide in selecting materials. It should be particularly valuable in eliminating the obviously unsuitable materials, leaving the field open for further investigation and comparison with those having a higher degree of resistance.

How To Get Tax Protected Income and Capital from Oil and Gas Investments *by the J. K. Lasser Tax Institute and John D. Cunnion; 177 pages; published by Business Reports, Inc., Larchmont, New York; $12.50.*

This volume goes exhaustively into oil investments covering such things as how to acquire oil interests, the risks and profit potential, tax aspects, capital gains, etc., through 27 chapters.

The introduction points out that oil production has exceeded demand several times in recent years, yet the author believes that long term economic projections for the oil industry and its products are exceptionally bright. He mentions, of course, the growth of petrochemicals.

This is a revised edition of a report published in 1956. It has been expanded and brought up to date to reflect changes in the tax laws since the first publication. One chapter that was added discusses investment in government oil leases and another covers tax record keeping and the tax return for the taxpayer who has made an investment in oil.

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Materials: Carbon Steel, 4140, Monel, Aluminum, Brass, and various types of Stainless Steel
Packings: Teflon, Asbestos types, and other materials
Mountings: Regular and Panel
Dealers in all major cities

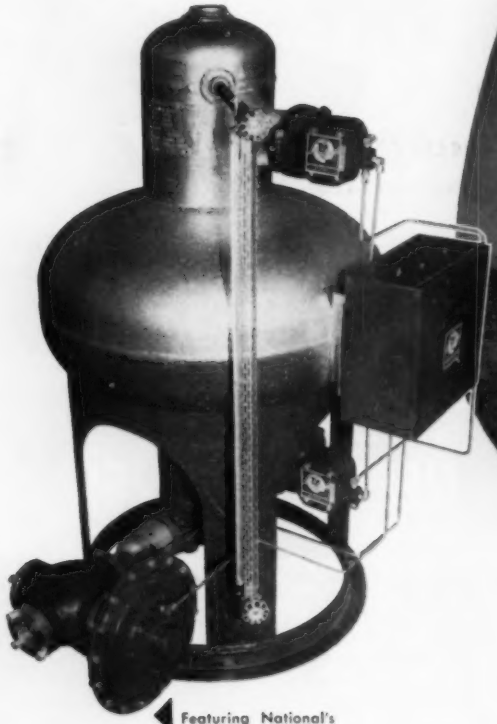
SOFT SEAT NEEDLE VALVE — Vacuum to 6,000 psi, – 100°F to + 500°F
FAST SHUT-OFF NEEDLE VALVE
Cam action lever handle, 10,000 psi
REMOTE CONTROL NEEDLE VALVE
Holds 10,000 psi with 50 psi on diaphragm
CRYOGENIC NEEDLE VALVE
–320°F, 10,000 psi

Write for Catalog

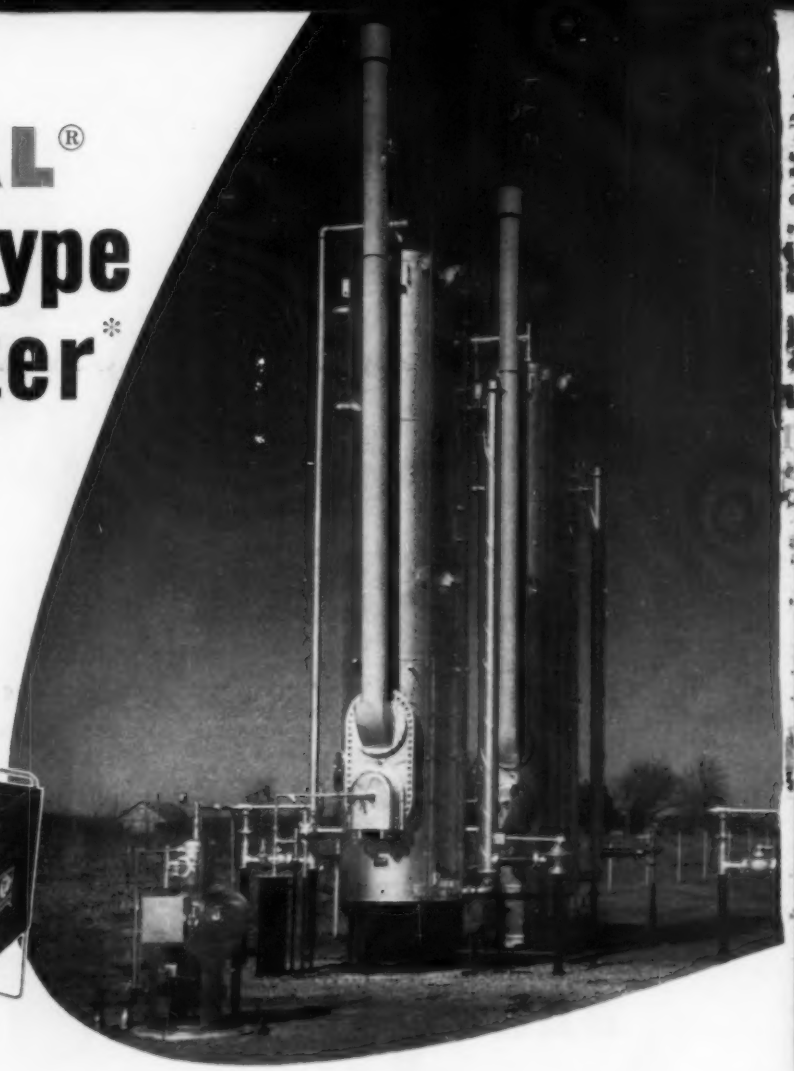
DRAGON ENGINEERING CO., INC.
Since 1946 P.O. BOX 185, NORWALK, CALIFORNIA

NATIONAL®
Seraphin-Type Liqua-Meter*

For accurate measurement of production from individual wells under a common royalty



Featuring National's New 3-Way Valve



A PLUS Value with all National Products . . . Engineers and field crews available from over 50 service and warehouse stocking points for complete units or spare parts to size, install and service National Seraphin-Type Liqua-Meters.

- **Three-way, three-position liquid valve prevents "slippage" for greatest repeatability.**
- **Each meter water-calibrated in the shop to meet the requirements of certain State Commission rules.**
- **Liquid valve internals are completely removable and all stainless steel for longest life.**
- **Reduced liquid surface area for highest meter repeatability.**
- **Greater dependability provided through two sensitive liquid level controls.**
- **Control booster relay in weather-proof, tamper-proof box insures fast, positive liquid valve action.**
- **Corrosion resistant trim in all valves and controls.**
- **All components rust and weather-proofed.**
- **Accurate within the limits prescribed by producer, royalty owner and regulatory body for measuring oil to be commingled.**

*Trademark of National Tank Company
Patent No. 2936622

It's a National®

NATIONAL TANK COMPANY

DRAWER 1710

TULSA, OKLAHOMA

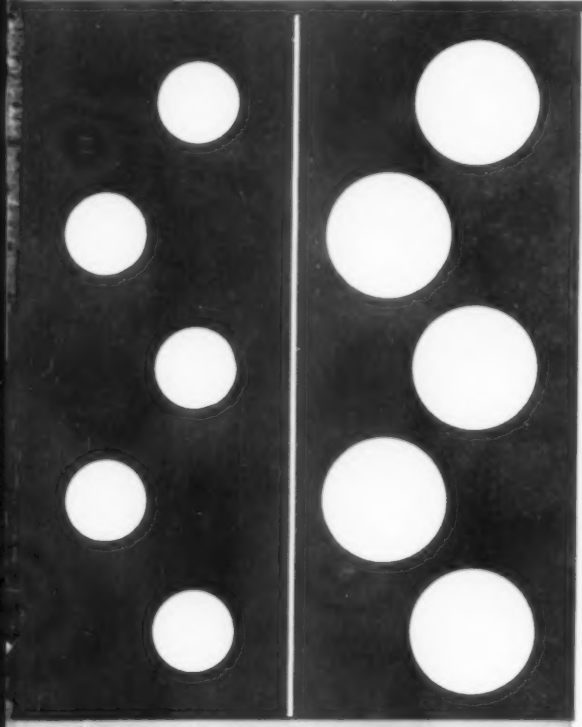
Another FIRST by LANE-WELLS

BIG HOLE PERFORATING

For Formation Treating

56% LARGER Diameter • 144% LARGER Opening

780 SUPER E BULLET



Comparison of area of standard perforations (above, left) and 780 Super E perforations (above, right).

You are looking at the actual size of perforations produced by Lane-Wells new 780 SUPER E BULLET Perforating. Compare these holes with the size of perforations produced by standard bullets—compare the hole size with even smaller holes by other types of perforating.

Designed especially to produce a large hole and maximum formation cracking, the 780 SUPER E BULLET really paves the way for hydraulic fracturing, explosive fracturing, acidizing, and other types of formation treatments. Because the 780 SUPER E BULLET is fired by a standard Lane-Wells Type E gun, you get all the advantages of selective firing and proved performance.

Ask your nearest Lane-Wells representative about this newest service by the company that originated perforating for the petroleum industry!

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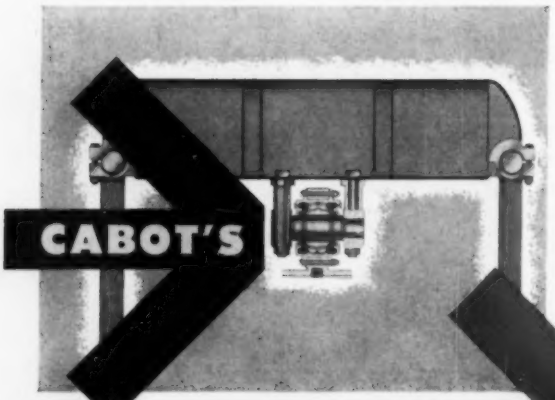
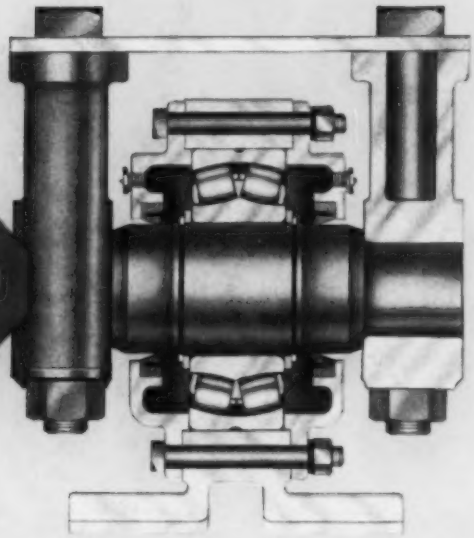


CABOT'S

NEW EQUALIGN BEARING

PUMPING UNITS
THAT STAY YOUNG LONGER



CALL YOUR J&L MAN

Our engineers advise us that our new Equalign Pumping Units have many improvements as well as geometric design for equal torque factors.

We advise you to see this new series at your nearest J & L Supply store, for here are units engineered for long, trouble-free life — backed by Cabot's 24-hour field service . . . another reason why it pays to get the Cabot habit.

✳ New Equalign Bearing

The Cabot Equalign Bearing contains a heavy duty spherical roller bearing which gives universal equalization. Grease and relief fittings are arranged so that grease is forced through the bearing with each greasing. The pumping units equipped with this type bearing are designed for equal torque factors. Pin-end pitmans are used.

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